SOMAS®

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Mi-502 EN

Service and operating instruction
Manual Gear (Rotork)

Introduction

This operating manual is intended for the operating, maintenance and supervisory personnel.

This operating manual also describes components, equipment and ancillary units which are not or only partially included in the scope of supply.

The operating personnel must have read, understood and must comply with this operating manual.

We keep the right to do any technical changes which are necessary to improve the product without prior notice.

These instructions provide information about Rotork Manual Gears.

They are for use by personnel who are responsible for installation, operation

and maintenance of Rotork Manual Gears.

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Valve supplier

Somas Instrument AB
Norrlandsvägen 26-28
SE-661 40 SÄFFLE
SWEDEN

Phone: +46 (0)533 69 17 00
E-mail: sales@somas.se
Website: www.somas.se

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1 Preliminary remarks

To enable you to find information quickly and reliably in the operation manual, this chapter familiarises you with the structure of the operating manual.

This manual uses symbols and special characters which make it easier for you to find information. Please read the explanations of the symbols given in the section below.

Ensure that you read all the safety instructions in this operating manual very carefully.

You will find safety instructions in section 2, in the foreword to the sections and before any working instructions.

1.1 Explanation of warnings, symbols and signs

1.1.1 Warnings

Warnings are used in this operating manual to warn against injury and material damage. Always read and observe these warnings. Warnings are identified by the following symbols:

In this manual are used diverse types of safety and warning notices:

Danger!	
Type of danger. Advise for imminent danger. Not attention of the advices could be mortal or cause severe injuries as a consequence. Explanation of the countermeasures.	International Safety symbol

Warning!	
Type of danger. Advise for imminent danger. Not attention of the advices could cause severe injuries or property damage as a consequence. Explanation of the countermeasures.	International Safety symbol

Attention!	
Type of danger. Advise for possible danger. Not attention of the advices could cause property damage as a consequence. Explanation of the countermeasures.	International Safety symbol

Note

Advices and give tips for better understanding of the manual or a better handling of the valve.

1.1.2 Symbols and signs

Symbols and signs are used in this operating manual to provide fast access to information.

1.1.2.1 Symbols and signs in the text

Symbol	Denotation	Explanation
⇨	Operating instructions	This means there is an action to be carried out.
1. 2.	Operating instructions, multi-step	Work instructions must be carried out in the sequence shown. Deviations from the sequence shown may result in damages to the valve and accidents.
• –	Lists, two-stage	No activities are linked with lists.
➔	Cross-reference	References to images, tables, other sections or other instructions.

Tab.1-1 Symbols in the text

2 Safety

2.1 Safety instructions

2.1.1 General dangers

Sources of danger resulting in general hazards:

- Mechanical hazards

2.1.2 Additional hazards

2.1.2.1 Entanglement, crushing and cut/sever hazards

- by moving actuator parts left exposed, by removing covers for inspection, sampling, etc.

2.1.2.2 Burning or scalding hazards

- by opening or leaving open function-check and/or sampling openings on systems operating at high temperatures (above 40°C)
- by operating temperature >= 70°C. Short contacts (approx. 1s) of the skin with the surface of the valve may cause burns (pr EN 563)
- by operating temperature = 65°C. Longer contacts (approx. 3s) of the skin with the surface of the valve may cause burns (pr EN 563)
- by operating temperature 55°C…65°C. Longer contacts (approx. 10 ... 3s) of the skin with the surface of the valve may cause burns (pr EN 563)

2.1.2.3 Explosion hazards

A high surface temperature on a valve and actuator, constitutes (a risk for burn injuries, and) a risk of ignition of explosive atmospheres in ATEX applications.

The surface temperature of the equipment is not dependent on the equipment itself, but on the ambient conditions and the process conditions. The protection from the surface temperature is the responsibility of the end user, and must be effectuated before the equipment is put into service.

2.1.3 State of the art

This product has been acquired by Somas Instrument AB in accordance with state-of-the-art standards and the recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the user or of third parties, or cause damage to the valve and to other material property, if:

- the product is not used as designated
- The product is operated or repaired by untrained personnel
- the product is modified or converted improperly and/or
- the safety instructions are not observed

Therefore, every person involved in erecting, operating, inspecting, maintaining, servicing and repairing the gear must read, understand and observe the complete operating instructions, particularly the safety instructions.

2.1.4 Preconditions for using the gear

The gear only has to be used:

- in perfect technical condition
- as designated
- according to the instructions in the operating manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the gear
- if all protective devices are installed and operative

Rectify immediately any functional disorders, especially those affecting the safety of the valve!

2.2 Designated use of the gear

2.2.1 Use

Rotork Manual Gear are suitable to be assembled on the industrial shut-off valves from Somas.

If you want to use the gear with another shut off valve please contact Somas Instrument AB. The specified operating and limit values as well as the ambient temperature must be complied.

Particular data to the operation and limit values are specified on the data sheet „Si-502EN“.

The operating values, limit values and setting data must not deviate from the values specified in the operating manual and corresponding information sheet without consulting the manufacturer! The manufacturer cannot be held liable for any damages resulting from non-observance of the operating manual.

2.2.2 Liability for non-designated use

Using the gears for other purposes than those mentioned previously is considered contrary to its designated use. For resulting damages of this, Somas Instrument AB is not liable! The user take the risk.

2.3 Organizational measures

2.3.1 Availability of operating manual

The operating manual has to be stored and be readily available!

2.3.2 Additional regulations

In addition to the operating manual, it has to be observed all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection! Direct the personnel to comply with them!

2.3.3 Checks

Periodically check that the personnel carry out the work in compliance with the operating manual and that they pay attention to risks and safety factors.

2.3.4 Protective equipment

When necessary use protective equipment.

2.3.5 Rebuilds or modifications of the gear

Do not make any rebuilds or modifications of the gear itself, which can affect the security of the gear.

2.3.6 Replacing damaged parts

Manual hand gears are normally not repaired. Faulty gears are replaced by new.

2.4 Selection and qualification of personnel

Operation, maintenance and repairing works require special knowledge and may only be carried out by trained technical specialists or qualified personnel authorized by the user.

2.5 Safety instructions for manual gears

Operation of the gear is always subject to the local safety and accident prevention regulations.

Danger!

Risk of injury!
Do not place hands and fingers in the area of moving parts of the valve or of the gear when someone else is turning the hand wheel.

Warning!

Ensure that personnel who work with, install or repair the gear are appropriately trained. This prevents unnecessary damage and accidents or injury to personnel.

The maintenace and assembly personnel must be familiar with the process of installing and disassembling the gear in a process line, the special and possible risks of the process and the most important safety regulations.

The repair and assembly personnel must be familiar with the risks when handling pressurised equipment, hot and cold surfaces, dangerous substances and substances which represent a hazard to health.

Warning!

Before carrying out maintenance or repair work, installation and removal of an gear from a valve in the pipeline, always depressurise the valve in the pipeline, isolate the valve and remove the medium.
The pressurised medium may lead to injuries to personnel.

Warning!

Protect yourself against noise - use the relevant safety equipment.

Warning!

Beware of very cold or hot surfaces!
The gears may become very cold or very hot during operation. Protect yourself against frostbite and burns.

Warning!

When transporting and handling the manual gear, observe the weight of the gear or of the whole unit.
Place the hoisting ropes securely according to lift instruction.
The gear may injure persons if dropped.
Do not walk under suspended loads.

3 Description

3.1 General information

The Rotork manual gear is a quarter-turn gear. The gear is available in different sizes. Each gear has adjustable open and closed position stops. As standard the gear can be mounted on the valve in two positions A or C. If nothing is specified the gear is mounted in position A.

And as an option the gear can be mounted in two mounting positions B or D.

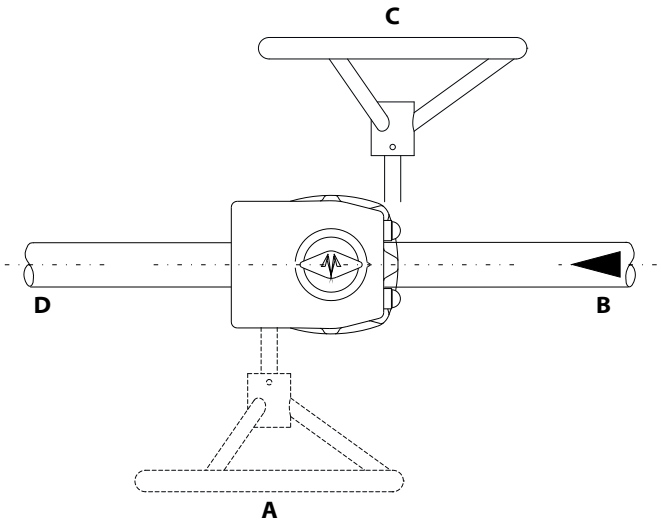

Fig.3-1

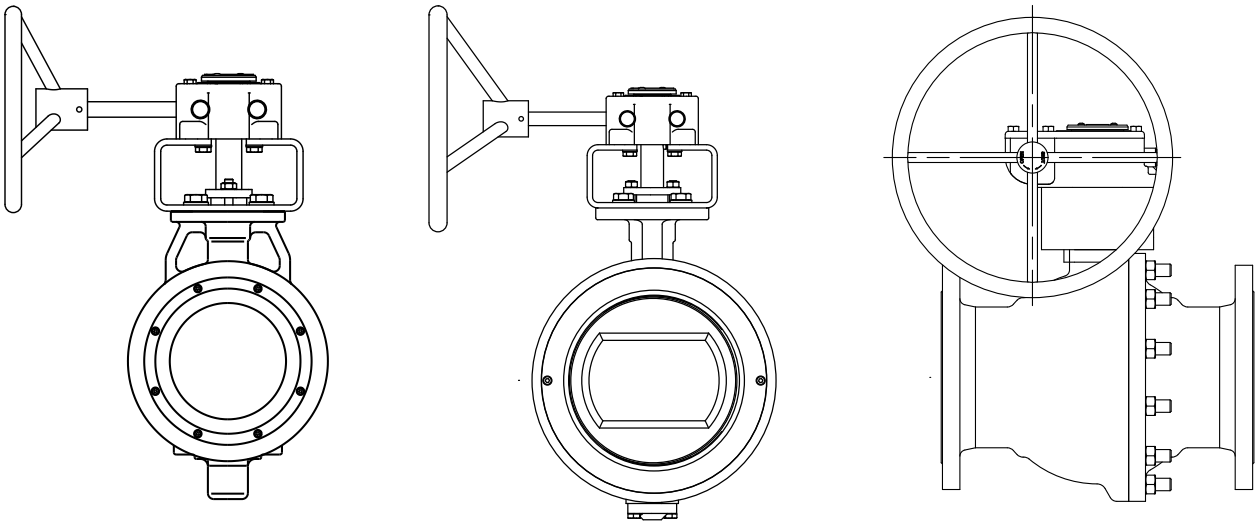

Fig.3-2

3.2 Maneuvering

Clockwise rotation of the hand wheel or chain wheel drives the gear and valve clockwise towards the closed position of the valve, and counterclockwise rotation opens the valve.

The approximate number of hand wheel or chain wheel turns to drive the valve 90° are:

Model **AB Range**	**Number of turns**
AB 150	10
AB 210/215	9,25
AB 550	8,5
AB 880	9,5
AB 1250	13,75
AB 1950(LB)/PR4	54,25
AB 2000 (LB)	27,25
AB 3000 PR4 (LB)	60,75
AB 3000 PR6	87
AB 6800 (LB)/PR6	165,56
A 200/PR10	182,25
AB 250/PR10	182,25

Tab.3-1

With the optional lock device, the hand wheel may be locked with a padlock at any 1/8-turn increment.

3.3 Lubrication

The gear is lubricated at the factory, and does not require further lubrication.

3.4 Accessories

The manual gear can be equipped with different accessories, e.g. position limit switches, Chain wheel and lock device. Please observe the assembly instructions for each component.

Locking device

Limit switch Proximity sensor

Limit switch 3845 (NAMUR)

Chain wheel

Warning!

When transporting and handling the gear, observe its weight.
The gear or parts thereof may injure persons if dropped.
Do not walk under suspended loads.

4 Mounting and adjustment

4.1 Unpacking, storage and transportation

Inspect the manual gear for transport damage when unpacking. The gear must be stored on an suitable base on a dry, cold and clean place and be protected against dirt until installed.

- Transportation must be carried out with suitable hoisting equipment
- Use lifting straps to lift the gear, when this is installed on the valve (➔ Fig.4-1).

The picture shows a standard situation. Please note that all possible situations that can occur cannot be covered in this lift instruction.

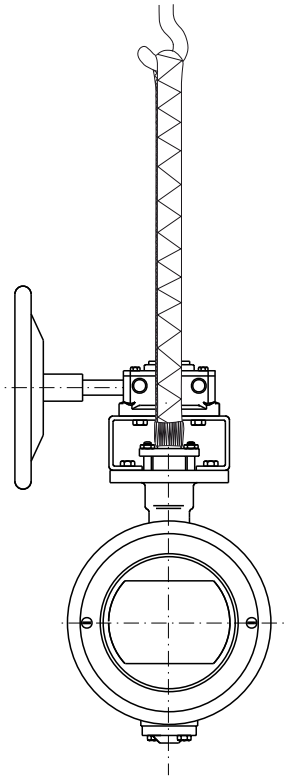

Fig.4-1

4.2 Assembly of the manual gear

4.3 Adjustments

The open and closed position stops prevent the gear from rotating beyond the open and closed positions of the valve.

Each stop is adjustable. If the gear is factory-mounted on the valve, the stops are preset, and do not require further adjustment.

If the gear is not factory mounted on the valve, or if the gear has been removed, the stops will require adjustment as described below.

Refer to (➔ Fig.4-2) for component identification; also refer to the Valve Instructions for specific closed-position requirements for the valve.

4.3.1 Adjustment of closed position stop

1. Loosen the lock nut on the closed position stop screw, and back out the stop screw about two turns.
2. Turn the hand wheel so that the valve is in the closed position (See relevant “Service and operating instruction” to actual valve).
3. Turn the closed position stop screw clockwise until resistance is felt from the stop screw contacting the gear inside of the gear.
4. Hold the stop screw from turning, and tighten the lock nut.

4.3.2 Adjustment of open position stop:

1. Loosen the stop nut on the open position stop screw, and back out the stop screw about two turns.
2. Turn the hand wheel so that the valve is in the open position.
   (See relevant “Service and operating instruction” to actual valve).
3. Turn the open position stop screw clockwise until resistance is felt from the stop screw contacting the gear inside of the actuator.
4. Hold the stop screw from turning, and tighten the lock nut.

4.3.3 Removing Hand Gear from Valve

Refer to (➔ Fig.4-2) for component identification.

Warning!

Flow in the pipeline with the hand gear actuator removed can slam the valve closed causing personal injury and damaging the flow system.
Shut down the flow in the pipeline before removing the gear from the valve

1. Close the valve.
2. Remove the four mounting screws (➔ Fig.4-2/4) and washers (➔ Fig.4-2/3).
3. Remove the gear from the valve.

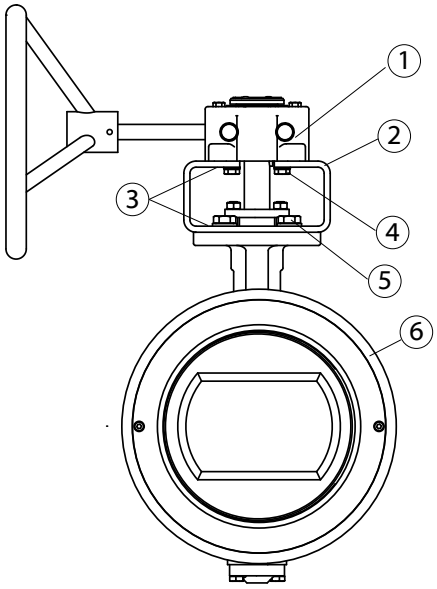

Fig.4-2

1	Hand gear	4	Bolt
2	Mounting bracket	5	Bolt
3	Washer	6	Valve

4.3.4 Mounting Hand Gear on Valve

Refer to (➔ Fig.4-2) for component identification.

1. Put both the gear (➔ Fig.4-2/1) and the valve (➔ Fig.4-2/6) in the closed position.
2. Mount the mounting bracket (➔ Fig.4-2/2) on the valve (➔ Fig.4-2/6) tighten the bolts(➔ Fig.4-2/5).
3. Select the desired gear mounting position (A or C) from the optional positions shown on the (➔ Fig.3-1). Put the gear on the valve shaft, and slide the gear into position on the top of the valve.
4. Tighten the bolts (➔ Fig.4-2/4).

4.3.5 Troubleshooting

Condition	Possible Cause	Corrective Action
Valve closes to wrong position.	Closed position stop is set incorrectly.	Adjust closed position stop. See ADJUSTMENTS section.
Valve opens to wrong position.	Open position stop is set incorrectly.	Adjust open position stop. See ADJUSTMENTS section.
Valve will not fully operate valve.	Pipeline obstruction in valve is preventing closure.	Remove obstruction.

Tab.4-1

Head office: **Somas Instrument AB**
Norrlandsvägen 26 SE-661 40 SÄFFLE
Sweden

Phone: +46 (0)533 69 17 00
E-mail: sales@somas.se www.somas.se

48111-EN