LOCKING DEVICE
For cylinder actuators
Types B_Q, B_W and B_QW

Installation, Maintenance and Operating Instructions
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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the cylinder unit.
If you require additional assistance, please contact the manufacturer or manufacturer’s representative.
Addresses and phone numbers are printed on the back cover.

SAVE THESE INSTRUCTIONS!

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1 GENERAL

This locking device is designed for Metso AB1-series actuators. Locking device is intended to be used for safety lock up function during service operation. These instructions contain the information needed for operating the locking device, additional information on B-actuators are available from the instructions on installation, operation and maintenance of the model in question. The locking is carried out by a long screw, which disables the actuator piston movement. The valve locking can be done with zero backlash, which enables good tightness for example with butterfly valves.

The locking device can be recognized from type codes Q, W or QW. Letter W in type code is for locking device on cylinder head and letter Q means that locking device is installed on the bottom of the housing.

Safety lock up can be done usually to open or close position, end position of the operating range. Using both codes Q and W the locking can be adjusted to any position between open and close.

1.1 Parts and fittings

Locking device includes special parts for actuator’s control use and separate locking parts. The locking parts are needed only when safety locking is needed, otherwise these parts are on the specified location or on the stock.

The locking device parts on actuators B_W and B_Q are equal except on actuators BJ and BJA sizes 16-32. This is important because it is possible to use same locking screw and cap cover (separate parts) for open or closed direction locking (Q or W), except on previous mentioned actuators. See more detailed information from section 1.1.3.

1.1.1 Permanently mounted parts

Following parts are included in the locking device, other parts are similar to standard actuators:

- 270, 271 Spindle nut, (use as a limit screw)
- 272, 273 Lock nut (type DIN 981)
- 274, 275 O-ring
- 276, 277 Plug screw
- 278, 279 Hexagon socket screw
- 280, 281 Plug screw fastener (locking plate & wire)
- 285, 286 Spring pin

1.1.2 Separate locking parts

These parts are necessary only for safety locking, during standards operation use, they are dismantled.

Note: Actuator BCQ has same part numbering as BCW.

- 118, 287 Cap cover
- 128, 288 Hexagon lock screw
- 162, 289 Pin fastener (pin & wire)
- 282, 283 Hexagon lock nut
- 284 Hexagon socket screw

**CAUTION:**

Do not open the plug screw (276, 277) or lock screw (128, 288) while the actuator is pressurized.
### 1.1.3 Finding the correct locking parts for different actuators

One sizes of locking parts device sets device sets are usually suitable for many sizes of B.Q and B.W actuators. The possible combinations can be found out from Table 1.

- **a)** Cap cover (118, 287) and pin (162, 289)
- **b)** Hex lock screw (128, 288) and hex lock nut (282, 283)

### 1.1.4 Adjustment of valve travel stops

There are two adjustable spindle nuts in the actuator, one in the cylinder head and one in the bottom of the housing. These spindle nuts limits the movement of the piston in the extreme positions.

The spindle nut (270, 271) in locking device works as a limit screw and it should be adjusted similar to standard B1-actuator limit stop screw. The spindle nut (270, 271) is secured by a lock nut (272, 273). Non-hardening sealant, for example Loctite 255, should always be used for sealing the stop screw. Be careful when adjusting the limits, because the spindle nut may come out if turned too much.

### 2 SAFETY PRECAUTIONS

**CAUTION:**
Before installation or removal of locking device make sure it is permitted to manually operate the valve (without disturbing the process).

**CAUTION:**
Air pressure must always be released before detaching any parts from the locking device!

Do not remove the plug screw (276, 277) or lock screw (128, 288) while the actuator is pressurized. It can cause an uncontrolled pressure release which may result in damage or personal injury.

**CAUTION:**
Be careful when adjusting actuator travel stops.

The spindle nut (270, 271) may come out if turned too much. If the actuator is pressurized it can cause uncontrolled pressure release which may result in damage or personal injury.

**CAUTION:**
Do not use the lock screw for manual operation of the actuator or the valve!

This may damage the actuator cylinder, housing or locking device.
3 INSTALLATION AND OPERATION

Actuators with type code Q are designed for locking the valve closed and actuators with type code W are designed for locking the valve open. Actuators with type code QW have possibilities to lock the valve either open or closed and every position between open and closed, see Fig. 4.

3.1 Installing the locking device

The same instructions are valid for B_Q and B_W actuators. However, when the valve is locked open by BCW or BJW locking device (the procedure shown in these instructions), you must be more careful because of possible air pressure in actuator cylinder.

**CAUTION:**
Before installation or removal of locking device make sure it is permitted to manually operate the valve (without disturbing the process).

**CAUTION:**
Air pressure must always be released before detaching the plug screw (276, 277)!

- Remove air pressure from the actuator.
- Remove the plug screw (276, 277) and turn the lock screw (128, 288) to the same thread. Turn the lock screw (128, 288) until it reaches the piston rod, see Fig.5.

**Fig. 4.** a) Valve locked closed (B_Q)
   b) Valve locked open (B_W)

**Fig. 5.** Changing the plug screw (276, 277) to lock screw

- Connect air pressure and move the piston to the end position by using air pressure, see Fig. 6.

**Fig. 6.** Procedures to tighten the lock screw (128, 288)

Q Mechanical locking of the bottom of the housing
W Mechanical locking device for the cylinder end
3.2 Removing the locking device

- Release air pressure from the actuator if it is pressurized.
- Pull the pin (162, 289) off from the locking plate (280, 281) and remove the lock hat (118, 287).

**CAUTION:**

Air pressure must always be released before detaching the lock screw (128, 288)!

- Turn the lock nut (282, 283) loose and remove the lock screw (128, 288).
- Turn the plug screw (276, 277) to the thread in spindle nut (270, 271).
- Connect air pressure if it is needed to change the valve position.