Danfoss AME 655 Series Actuators For Modulating and Floating Control User Guide

Contents

Danfoss AME 655 Series Actuators For Modulating and Floating Control

Specifications

- Product Model: AME 655/658 SD/658 SU
- Operating Modes: AUTO
- Maintenance: Maintenance Free
- Operating Temperature: 5-95% RH (non-condensing)
- Torque: 3-5 Nm
- Input Power: 24-230 V AC/DC
- Output Power: Max 4 A,Min 3 W

Product Usage Instructions

Installation

1. Ensure power supply is disconnected before installation.
2. Mount the product securely in the desired location.
3. Connect power supply to designated input terminals.
4. Check all connections for proper grounding.

Operation

1. Switch the product to AUTO mode for normal operation.
2. Monitor LED indicators for status updates.
3. Adjust settings using the provided controls as needed.

4. Refer to the manual for specific operating modes and indications.

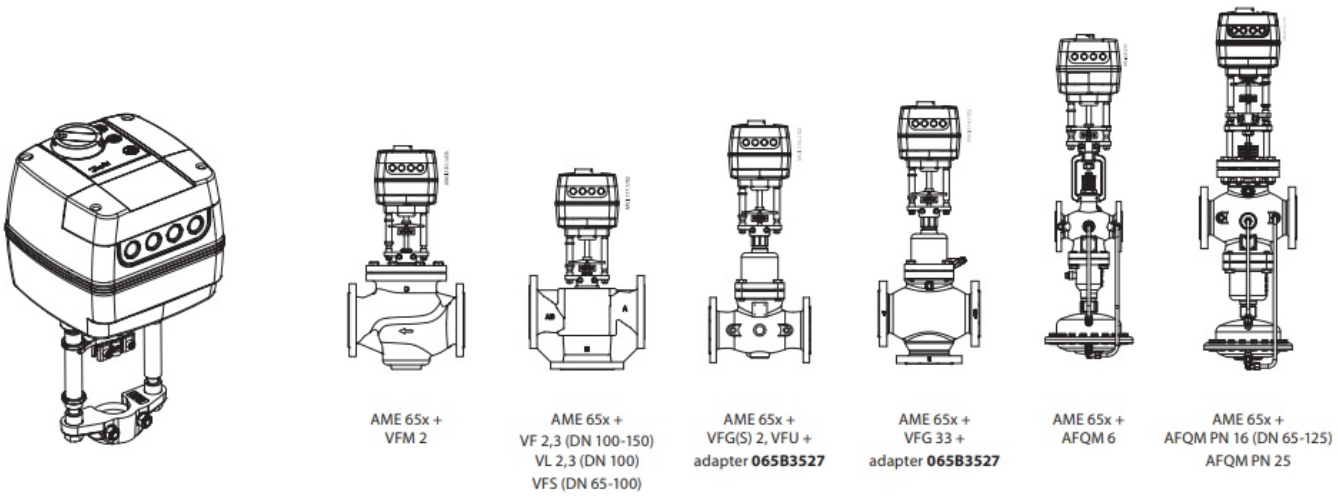
Maintenance

1. Perform regular checks for dust or debris accumulation.
2. Keep the product's exterior clean using a soft, dry cloth.
3. Avoid exposing the product to extreme temperatures or moisture.
4. Contact a qualified technician for any internal maintenance needs.

Frequently Asked Questions (FAQ)

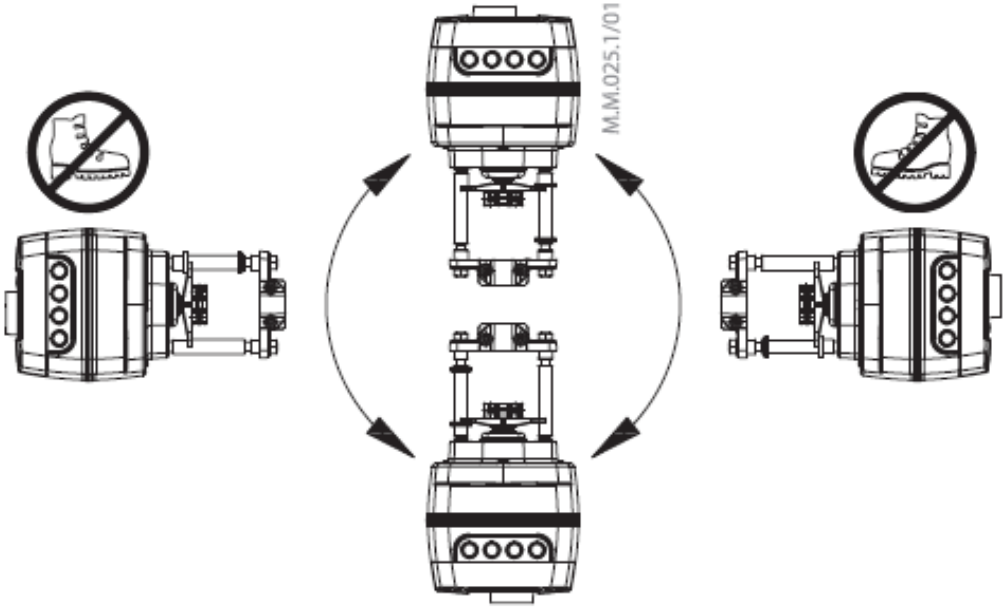
- **Q: What should I do if the LED indicator shows a constant red light?**
  A: A constant red LED indicates a standby-off mode. Check the power supply and connections for any issues.
- **Q: How can I reset the product if needed?**
  A: To reset the product, hold down the reset button for more than 5 seconds until the LED indicators change accordingly.
- **Q: What is the recommended torque for installation?**
  A: The recommended torque for installation is between 3-5 Nm. Use a torque wrench for accurate tightening.

Operating Guide
AME 655/658 SD/658 SU



Safety Notes

- To avoid personal injury and damage to devices, it is absolutely essential for these instructions and safety notes to be read carefully and reviewed prior to assembly and use.
- Do not dismantle actuator with the safety spring function! There is risk of injury and death in the event of improper handling!
- The actuator is heavy. Handle with care to avoid injury or product damage.



Disposal

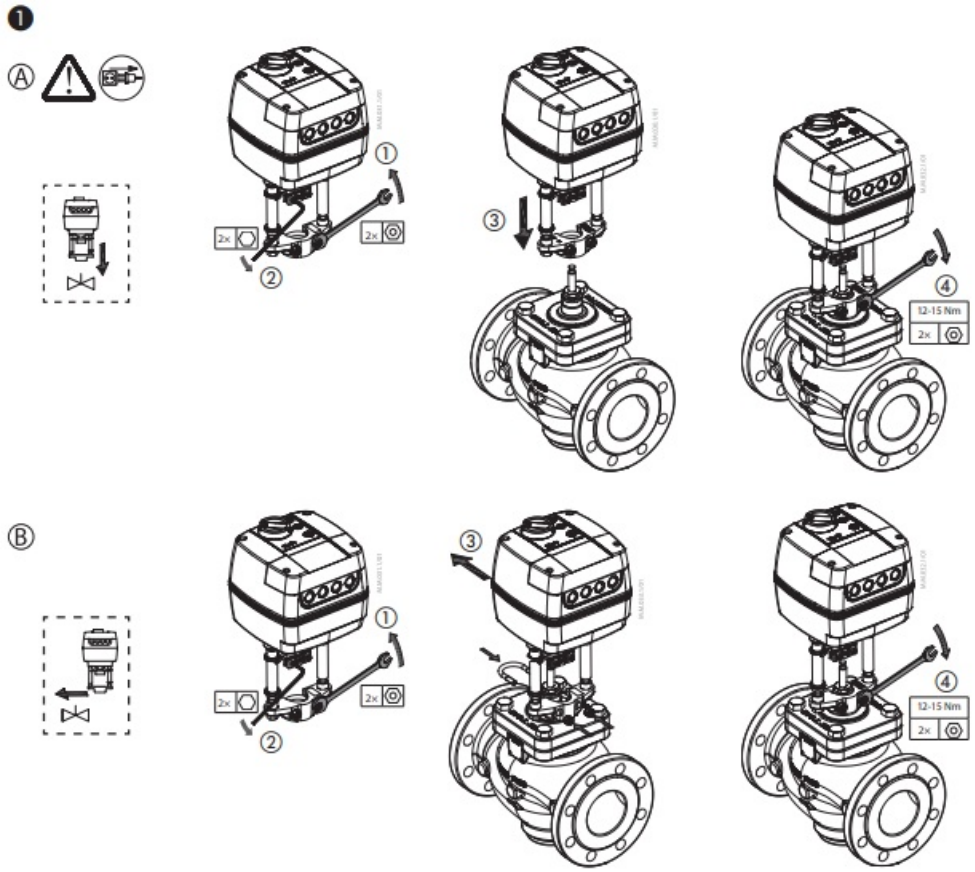
This product should be dismantled and its components sorted, if possible, in various groups before recycling or disposal.
Always follow the local disposal regulations.

Wiring

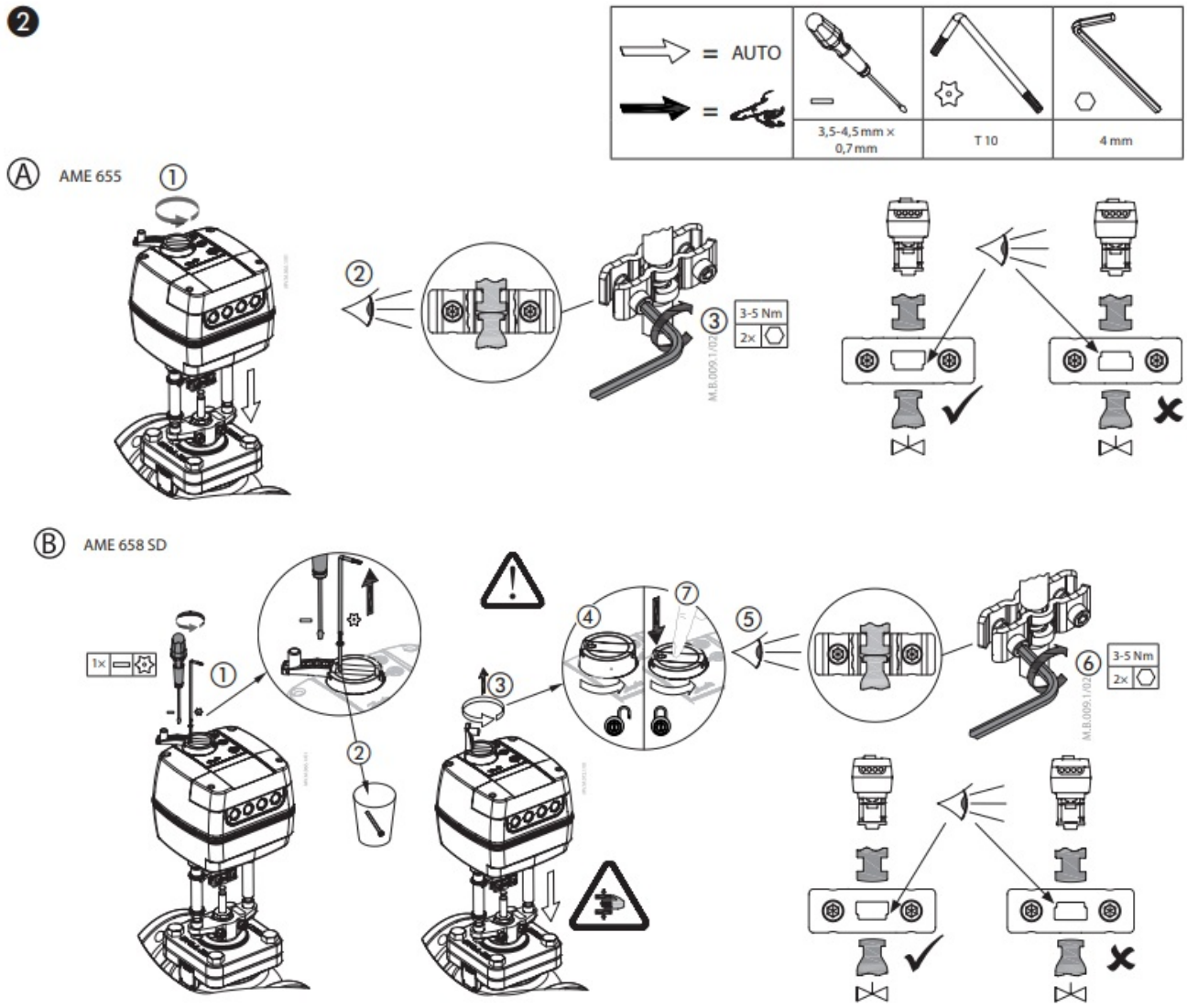
Do not touch anything on the PCB! Do not remove the service cover before the power supply is fully switched off. Max. allowed current output on terminals 4 and 5 is 4 A. Min. power is 3W.

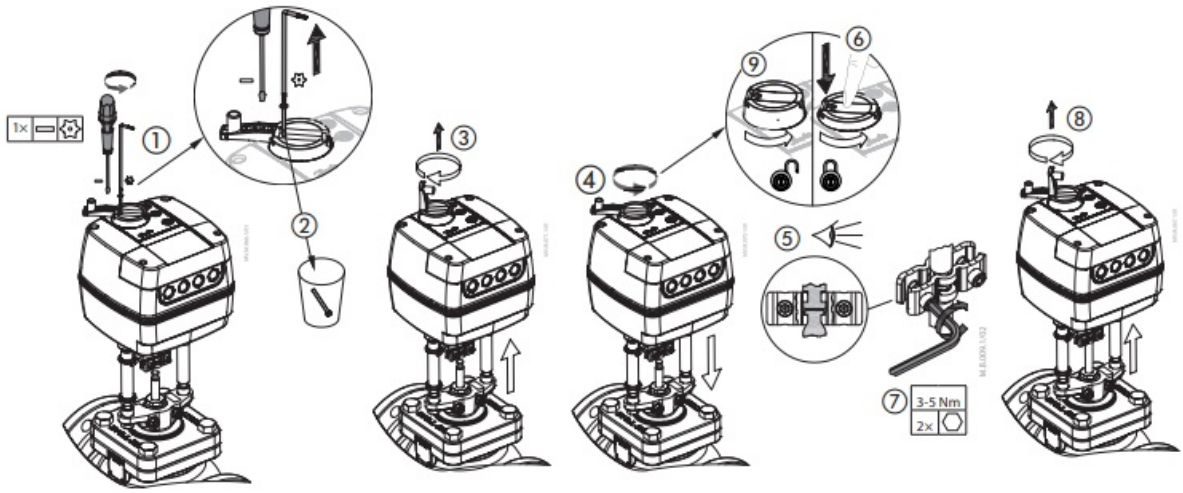
NOTE: Only basic function as SW1 (Fast/Slow) and SW2 (INV/DIR) are active when is no power supply on terminal SP and AME actuator operated as AMV.

1. Actuator mounting to valve ❶



2. Stem connections ❷





3. Electrical connection ❸

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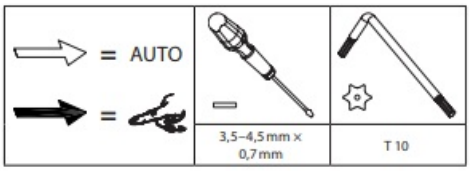

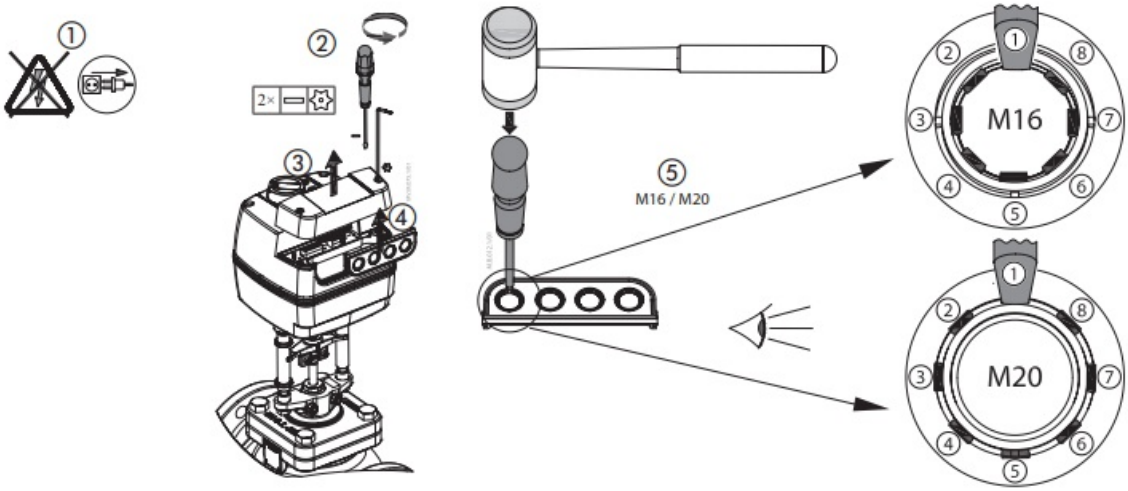

4. DIP switch setting ❹

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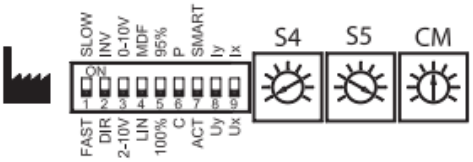

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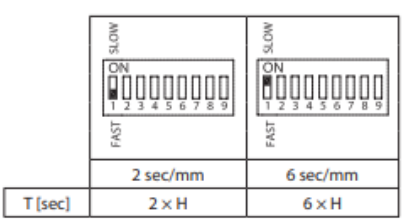
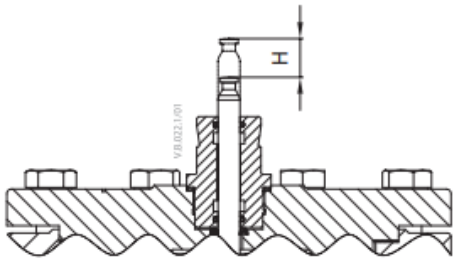
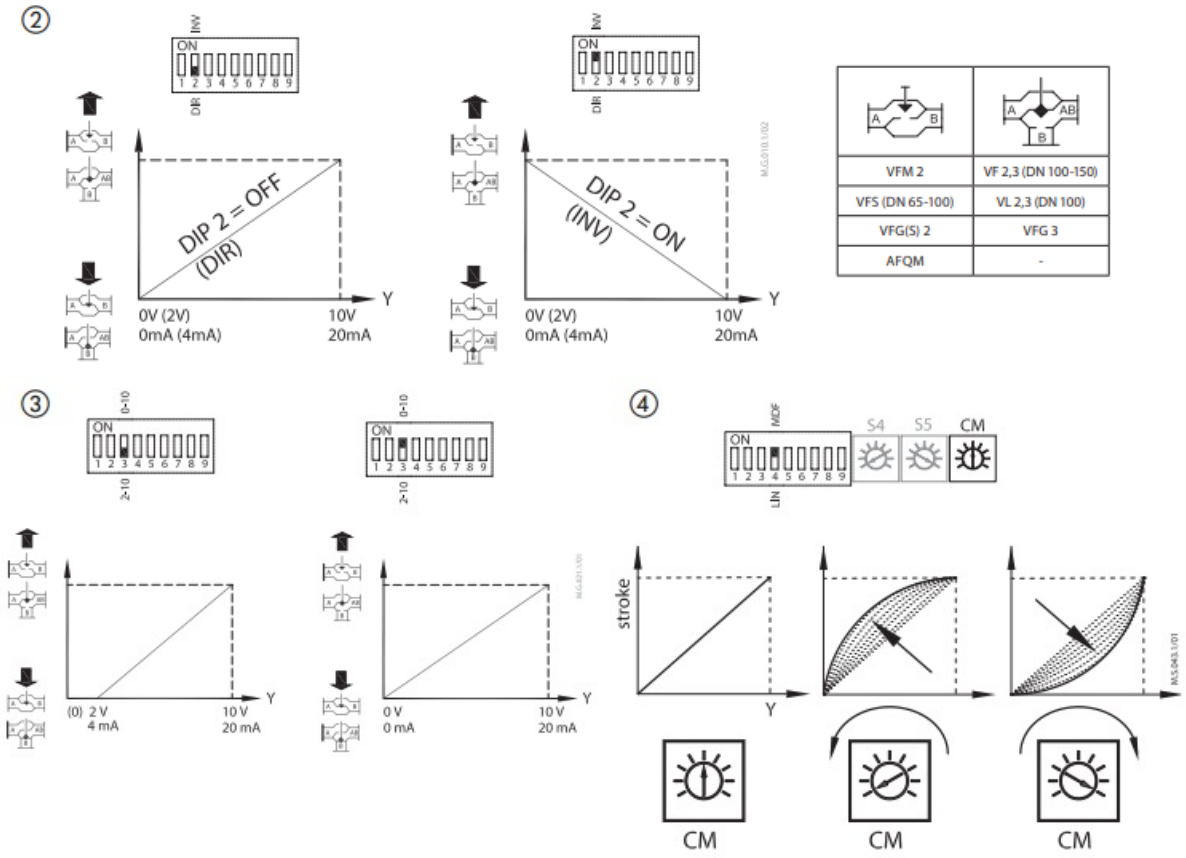


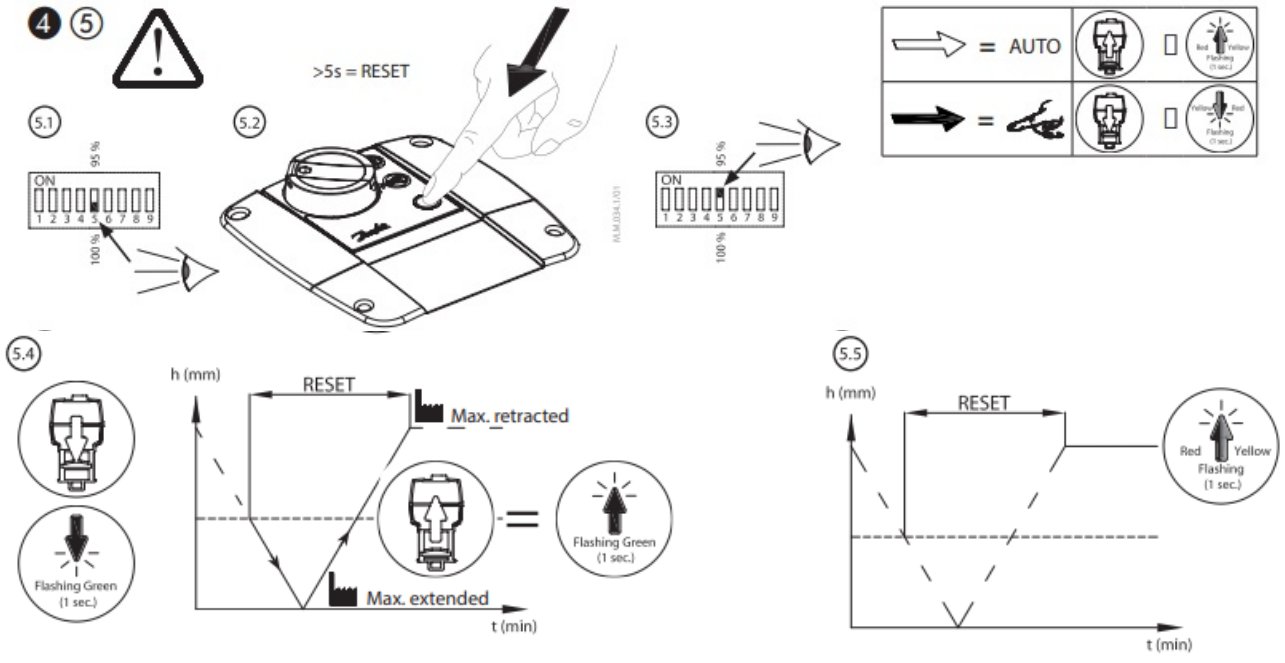
	2 sec/mm	6 sec/mm
T [sec]	2 × H	6 × H

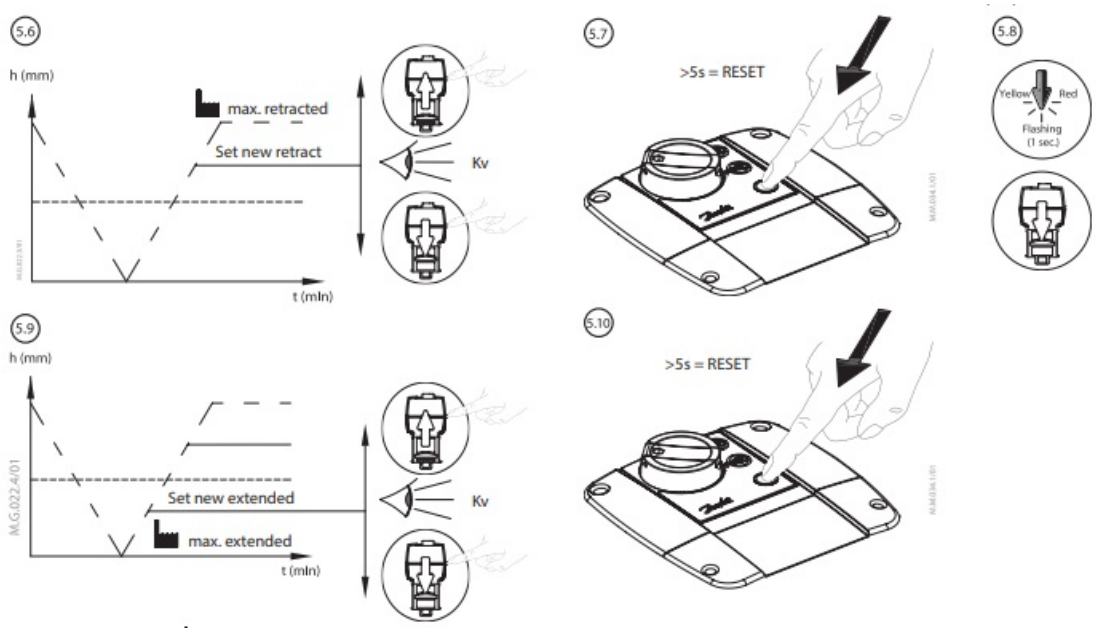




- **SW1: FAST/SLOW – Speed selection**
  - FAST; 2 s/mm
  - SLOW; 6 s/mm
  - SW2: DIR/INV – Direct or inverse acting selector ②
  - DIR; the actuator is directly reacting to input signal
  - INV; the actuator is inversely reacting to input signal
- **SW3: 2-10V/0-10V – Input/output ③**
  - 2-10V; the input signal ranges from 2-10 V (voltage input) or 4-20 mA (current input)
  - 0-10V; the input signal ranges from 0-10 V(voltage input) or 0-20 mA (current input)

    Signal range selector sets Y & X signals



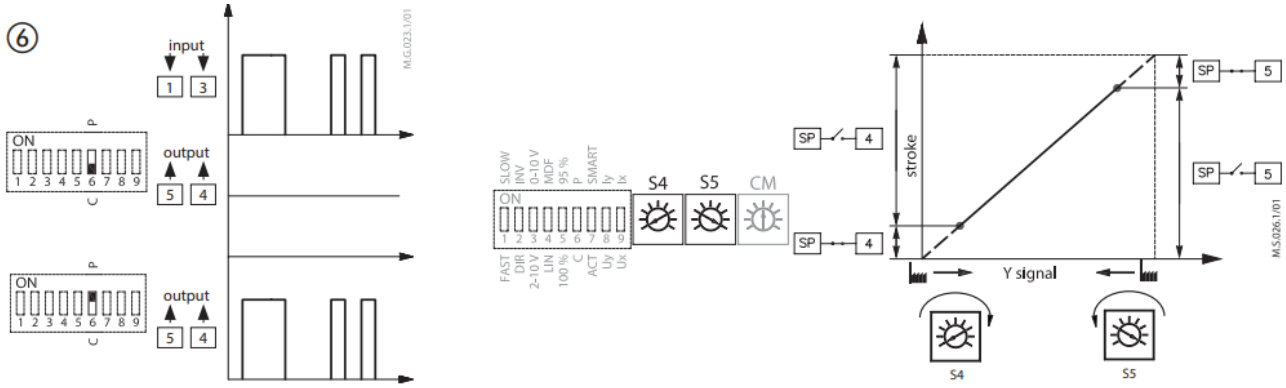


- **SW4: LIN/MDF – Characteristic modification function ④**
  - LIN; linear correlation between Y signal and stem position
  - MDF (Modified); enables modified correlation between Y signal and stem position. Degree of modification depends on setting of potentiometer CM.

    The function enables to change MCV (Motorised Control Valve) characteristic (for example linear to logarithmic and logarithmic to linear) and works with all combinations of DIP switch settings.
- **SW5: 100 %/95 % – Stroke limitation ⑤**

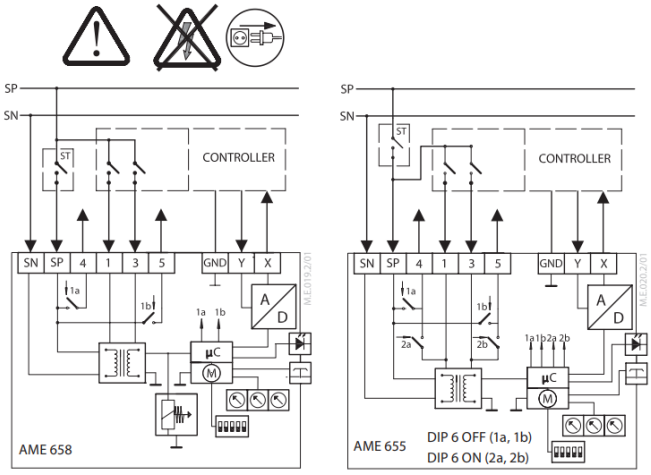
  Adjustable stroke limitation of retracted or extended actuator stem position.

  DIP 5 needs to be reset prior to procedure (5.2) to 100 % (5.1) and set to 95 % (5.3) until the selfst roking procedure has concluded (5.4). Retracted icon (5.5) on actuator will blink red-yellow when actuator stops at max. retracted stem position (5.5) and will blink as long as it is not set to a new retracted position (5.6) by pressing buttons to set the required position (observe flow on flow meter). Press and hold reset button for 5 seconds (5.7) and then set new extended stem position by pressing buttons . Extended icon (5.8) will blink red-yellow as long as it is not set to new extended position by pressing and holding reset button for 5 seconds.
- **SW6: C/P – Output signal mode selector ⑥**



  - An output signal is present on terminal 4 when the position of the actuator is equal to or lower than the S4 set point. An output signal is present on terminal 5 when the position of the actuator is equal to or higher than the S5 set point.

⑥ AME 655/658 operating as modulating version



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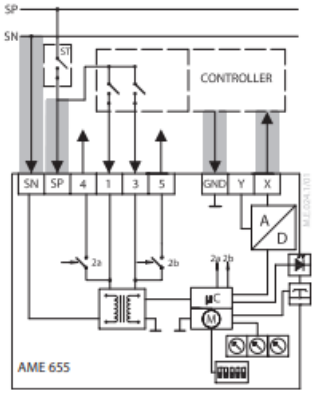
SN	0 V	Neutral
SP	24, 230 V AC/DC	Power supply
4, 5	SP (AC)	SP output -max 4 A -min 3 W
1 3	SP	Input
GND	0 V	Neutral
Y	0(2)-10 V 0(4)-20 mA	Input
X	0(2)-10 V 0(4)-20 mA	Output

SW6: C; provides a constant output signal on terminals 4&5, regardless of the input signal. SW6: P; provides a pulse signal through parallel or cascade electrical wiring input 1 & 3 dependents from the controller to output terminals 4&5.

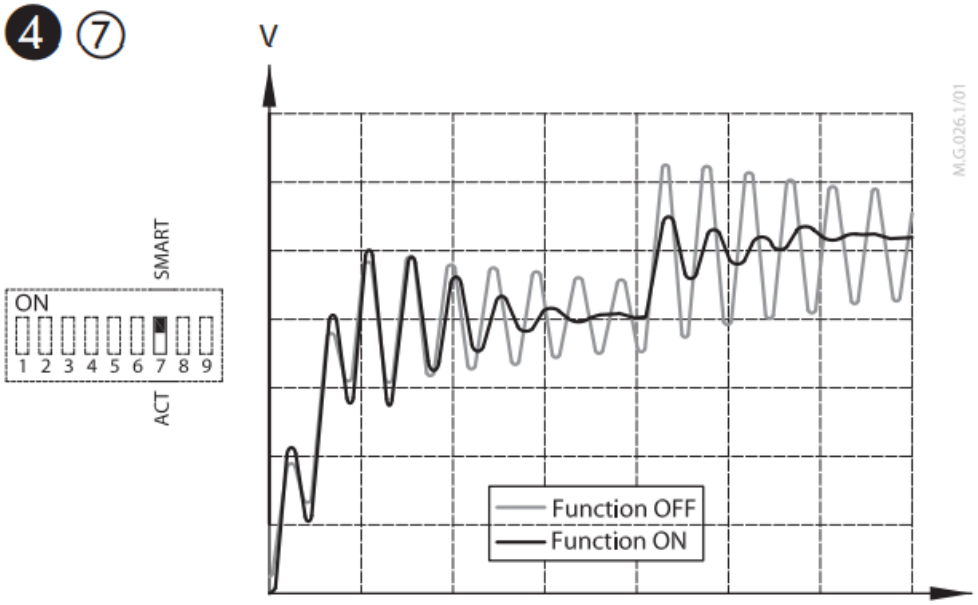
- **SW7: Smart function selector: ⑦**
  - OFF; the actuator does not try to detect oscillations in the system
  - ON; the actuator enables special anti-oscillation algorithm – In case control signal Y on certain point oscillates looking from time perspective, algorithm starts to lower the amplification of the output to the valve. Instead of having static characteristics actuator changes to dynamic characteristics. After the control signal does not oscillate anymore, output to the valve slowly returns back to static characteristics.

⑥ AME 655 operating as 3 point version



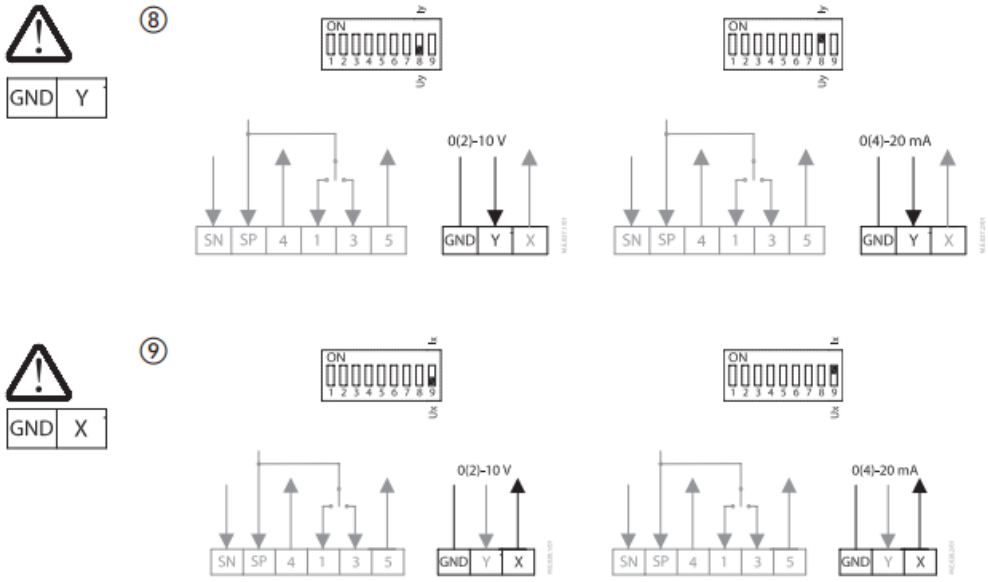
⑦

SN	0 V	Neutral
1,3	24, 230 V AC/DC	Power supply
4, 5	SP(AC)	SP output -max 4A -min 3W
1 3	SP	Input
X	Ix 0(4)-20mA	X output possible only when power supply is connected to the SN & SP. GND must be as well connected.
	Ux 0(2)-10V	



- **SW8: Uy/Iy – Input signal type selector: ⑧**
  - Uy; input signal Y is set to voltage (V)
  - Iy; input signal Y is set to current (mA)
- **SW9: Ux/Ix – Output signal type selector: ⑨**
  - Ux; output signal X is set to voltage (V)
  - Ix; output signal X is set to current (mA)

    NOTE: Y detection is disabled if SW8 is set to ON position and SW3 is set to OFF position.



Functions accessible from cover

RESET button

The actuators has an external RESET button, which is located on the top cover of the actuator next to the LED indicators. With this button you can enable or disable standby mode (press once) or self-stroking mode (press and hold for 5 seconds). See next paragraph for more details.

- Final step of electrical connection ❺

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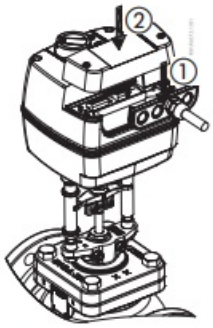
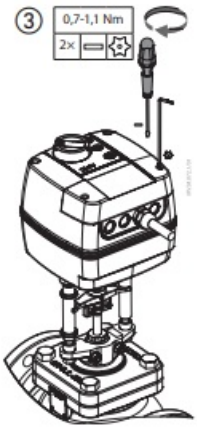
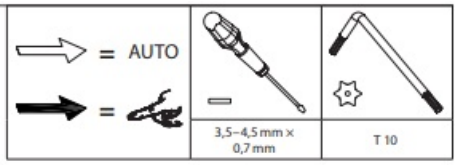


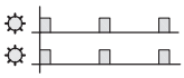
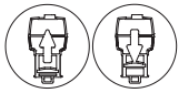


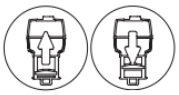
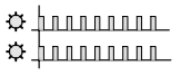
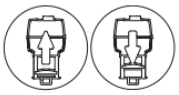
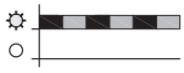
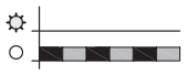


- LED signalisation ❻

❻

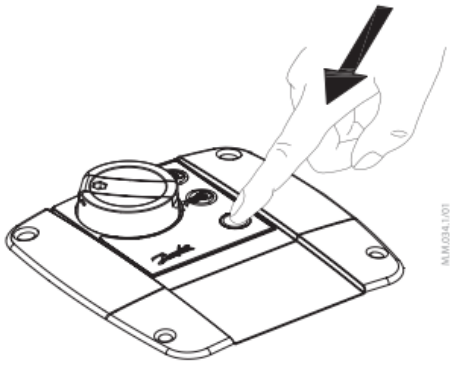
LED	Indication type			Operating mode
Green LED:			Constantly lit	Positioning mode - Actuator is retracting the stem
			Constantly lit	Positioning mode - Actuator is extending the stem
			Flashing (1 s cycle)	Self stroking mode - Actuator is retracting the stem
			Flashing (1 s cycle)	Self stroking mode - Actuator is extending the stem
Yellow LED:			Constantly lit	Stationary mode - Actuator has reached upper end position (retracted stem)
			Constantly lit	Stationary mode - Actuator has reached bottom end position (extended stem)

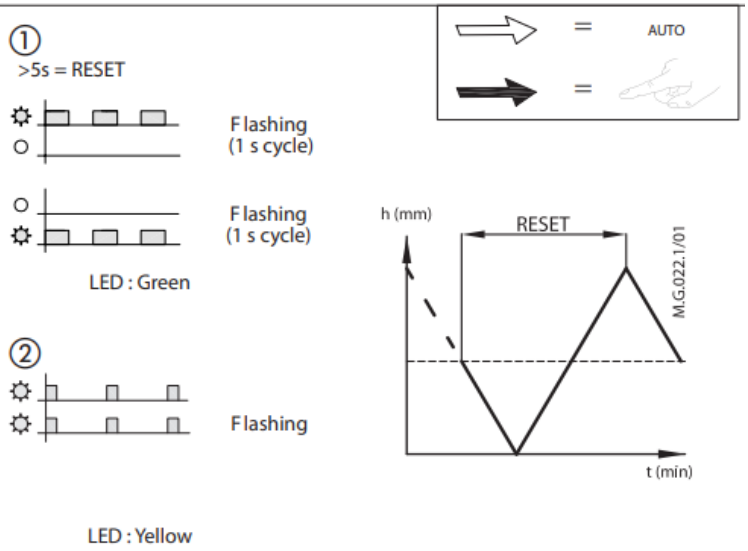
			Flashing	Stationary mode - Single blink when Y signal is presents and double blinks when Y signal is not connected)

LED	Indication type			Operating mode
Red LED:			Constantly lit	Stand-By mode
			Flashing	Error Mode
Red/ Yellow LED			Flashing (1 s cycle)	Set up stroke limitation (retracted stem)
			Flashing (1 s cycle)	Set up stroke limitation (extended stem)
Dark	No indication			No power supply

- Self-stroking mode ❼

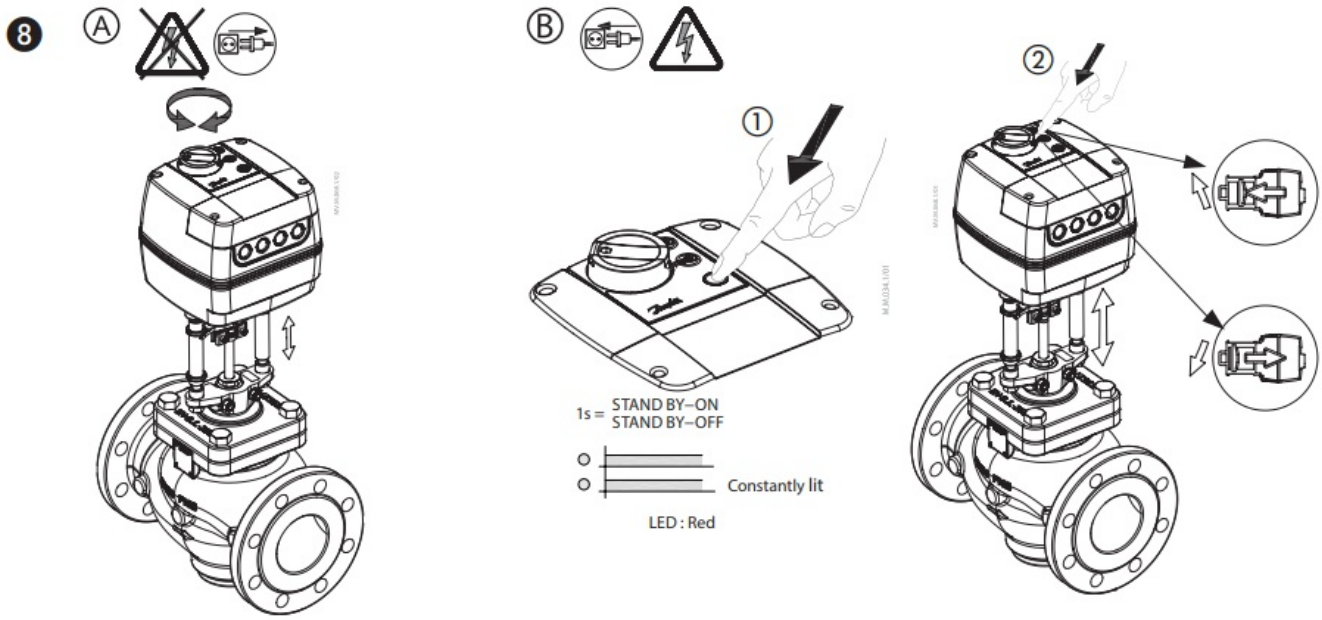
❼





- Self-stroking mode begins automatically the first time the actuator is powered on. To start the self-stroking procedure, press and hold the RESET button for 5 seconds ① until the green light starts flashing. End positions of the valve are automatically set and the actuator goes into stationary mode ② and starts responding to the control signal.

Manual Operation ⑧



Mechanical and electrical operation must not be used at the same time!
AME 655/658 actuators can be manually positioned when in standby mode or when there is no power supply (mechanically).

Actuator type	Mechanical operation	Electrical operation
AME 655		
AME 658		

Stand-By mode (versions AME 655/658) Press the RESET button ① to enter standby mode. The actuator stops in the current position and stops responding to any control signal. A red light remains constantly lit. You can now manually operate the actuator ②.

Mechanical manual operation
AME 655/658 actuators have a knob & crank on the top of the housing which enables manual positioning of the actuator.

Use Mechanical manual operation only when the power is disconnected. Mechanical and electrical operation are not allowed to be used at the same time!

Electrical manual operation
AME 655/658 actuators have two buttons on the top of the housing that are used for electrical manual positioning (up or down) if the actuator is in standby mode. First, press and hold the RESET button ① until the actuator goes to standby mode (red LED is lit). By pressing the button, the stem will be extended and by pressing the button, the stem will be retracted.

Dimensions

Part Name	Hazardous Substances Table					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Actuator housing	X	O	O	O	O	O
Ball bearing	X	O	O	O	O	O
Bearing cover	X	O	O	O	O	O
Stroke limiter	X	O	O	O	O	O
O: Indicates that this hazardous substance contained in all of the homogeneous material for this part is below the limit requirement in GB/T 26572;						
X: Indicates that this hazardous substance contained in at least one of the homogeneous material for this part is above the limit requirement in GB/T 26572;						

Documents / Resources

	Danfoss AME 655 Series Actuators For Modulating and Floating Control [pdf] User Guide 655, 658SD, 658SU, AME 655 Series Actuators For Modulating and Floating Control, AME 655 Series, Actuators For Modulating and Floating Control, Modulating and Floating Control, Floating Control, Control

References

- Danfoss – Engineering Tomorrow | Danfoss
- Pagrindinis puslapis | Danfoss
- User Manual