HVAC Actuators

Schneider Electric Motion

Make the most of your energy
Typical Applications of Actuators

Overview of Actuators
- Type: STM 6SF-L
- Type: STM
- Type: STA
- Type: STE analogue I/O
- Type: STE digital I/O

Technical Data
- Overview Torque <-> Type and Body Size
- Torque <-> Running Time <-> Body Size
- Possibilities: Maximum Cams <-> Body Size
- Type code for Actuators

Scale Drawings of All Body Sizes
Typical Applications of Actuators

Control electrical engineering

Electrically adjustable fittings

Valves for water treatment

Exhaust valves on boilers

Air valves for oil and gas burners
Control The Combustion Process

Energy efficiency solutions

Domestic

Commercial & Industrial
Control The Combustion Process

- Positioning of the air damper – air damper actuator
  - Opens and closes the air flap which is positioned between fan and combustion chamber
  - Closes the air channel which leads to the combustion chamber to avoid loss of heat
  - Optimizing the combustion process, reducing the fuel oil/gas consumption and reducing the air pollution by modulating the air flow with the air damper

- Gas and oil valve movement – gas/oil valve actuator
  - Opens and closes the gas valve or the fuel oil supply

- Mixing Assembly – mixing actuator
  - Moves the mixing assembly rsp. mixing head where the injector is assembled

- Mixing Water – water valve actuator
  - Moves the valve for mixing cold/hot water at the heater-boiler
Control The Combustion Process
Control The Combustion Process

The actuator moves the air flap and the gas or oil valve.
The Tubular Skylight

Function:
The tubular skylight system captures light through a dome on the roof and channels it down through an internal reflective system.

At the ceiling level, a diffuser that resembles a recessed light fixture spreads the light evenly throughout the room.

The actuator provided by Schneider Electric Motion controls the intensity of the daylight – designed for maximum comfort.
Overview About Actuators

The Actuators provided by Schneider Electric Motion …

… reduce your energy consumption
Type: STM 6SF-L

- Easy to use HVAC actuator
- Stall-resistant split-phase motor inside
- Mechanical spring inside for return movement and for a safety precaution in case of a power outage
- For lower performance range of burners
General data for actuator type STM 6SF-L

- Power supply: 230 V / 50Hz
- Sense of rotation: Counter-clockwise
- Control time: 6 s
- Driving torque: 20 Ncm
- Reverse torque: 1 Ncm
- Degree of protection: DIN 40050, IP40
- Temperature: Operation: 0..60°C
Type: STM

- Powered by synchronous motor for constant speed
- Mechanical control unit with adjustable cams
- Very precise start/stop behaviour
- Potentiometer for feedback signal as an option
- Available as clockwise or counter-clockwise version
Type: STM

General data for actuator type STM

- Power supply: 230, 110 or 24 VAC 50/60Hz
- Switching power: 10(2) A
- Degree of protection: DIN 40050, IP40
  IP54 (Q3, Q15)
- Temperature: Operation: 0..+60°C
The STA is based on the STM series, equipped with a relay on the control unit (e.g. for higher switching power and more switching possibilities)

The STA has the same general data as the STM
Type: STE Analogue I/O

- Electronic control unit with 0..10V or 4-20mA input for position control
- Two potentiometers to define the angle of rotation
- Two cams and switches inside as mechanical safety limits
- One additional switch for external use
- Very precise start/stop behaviour
- Feedback signal provided by integrated potentiometer
- Available as clockwise or counter-clockwise versions
General data for actuator type STE analogue I/O

- **Power supply:** 230V, 110V and 24V AC 50/60Hz
- **Switching power:** 10(2) A
- **Degree of protection:** DIN 40050, IP40, IP54 (Q3, Q15)
- **Temperature:** Operation: 0..+60°C
Type: STE Digital I/O

- Electronic control unit with digital I/O for position control (stepper driver)
- Speed-controllable via frequency of digital pulses
- Angle of rotation adjustable via digital pulse signal / number of pulses
- Very precise start/stop behaviour
- Feedback signal generated by integrated optical encoder system
- Reference marks for start/end positions
Type: STE Digital I/O

General data for actuator type STE digital

- Power supply: 24V DC
- Torsion angle: 0..90°
- Running Time: Variable, depending on external pulse frequency
- Degree of protection: DIN 40050, IP40
  IP54 (Q3, Q15)
- Temperature: Operation: 0..+60°C
The Actuators provided by Schneider Electric Motion …

… are customised products
Actuators: Customized Products

The following modifications are possible on demand

- Shaft: flattened, slotted, cross-hole, with pivot, thread or pinion, shorter, longer, etc.
- Run-time (e.g. from 3s/90° to 120s/90°) by changing the motor or gearbox parts
- Angle for adjustment (cam-position)
- Number of cams and switches
- Input supply voltage (24, 110, 230V)
- Modifications to the internal control unit
- Potentiometer-assembly
- Customised connection cable
- .... others on request.....
Actuator Product Range

- **STM 6SF**
  - 0.2 Nm (1.77 lbs-in)
  - 1.2 Nm (10.6 lbs-in)
  - 1.5 Nm (13.2 lbs-in)
  - 3 Nm (26.5 lbs-in)
  - 5 Nm (44.2 lbs-in)
  - 10 Nm (88.5 lbs-in)
  - 15 Nm (133 lbs-in)

- **STM & STA**
  - Q3
  - B0
  - B1-B3

- **STE digital I/O**
  - STM & STA
  - STM & STA
  - Q3
  - 1.2 Nm (1.77 lbs-in)
  - 3 Nm (26.5 lbs-in)
  - 10 Nm (88.5 lbs-in)

- **STE analogue I/O**
  - B0
  - B3
  - Q3
  - 1.5 Nm (13.2 lbs-in)
  - 3 Nm (26.5 lbs-in)
  - 10 Nm (88.5 lbs-in)
  - 15 Nm (133 lbs-in)

**Notes**
- Gearbox with low backlash
### Possibilities for STM & STA & STE analogue:

**Torque <-> Running Time <-> Body Size**

<table>
<thead>
<tr>
<th>Running Time for 90°</th>
<th>50 Hz [s]</th>
<th>60 Hz [s]</th>
<th>Rated torque [Nm]</th>
<th>Holding torque [Nm]</th>
<th>Body Size</th>
<th>Product Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2.5</td>
<td>1.6</td>
<td>0.4</td>
<td>B1</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.5</td>
<td>1.6</td>
<td>0.4</td>
<td>B2</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.5</td>
<td>1.6</td>
<td>0.4</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>2.9</td>
<td>1</td>
<td>0.3</td>
<td>B0</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>4.6</td>
<td>3.8</td>
<td>3</td>
<td>1.6</td>
<td>Q3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4.2</td>
<td>0.6</td>
<td>0.2</td>
<td>B0</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.0</td>
<td>1.4</td>
<td>0.4</td>
<td>B1</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.0</td>
<td>1.4</td>
<td>0.4</td>
<td>B2</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.0</td>
<td>1.4</td>
<td>0.4</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>5.8</td>
<td>4.5</td>
<td>1.4</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>8.3</td>
<td>6</td>
<td>4</td>
<td>Q3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10.0</td>
<td>3</td>
<td>1.1</td>
<td>B1</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10.0</td>
<td>3</td>
<td>1.1</td>
<td>B2</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10.0</td>
<td>3</td>
<td>1.1</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>10.8</td>
<td>1</td>
<td>0.6</td>
<td>B0</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12.5</td>
<td>15</td>
<td>10</td>
<td>Q15</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12.5</td>
<td>9</td>
<td>6</td>
<td>Q3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>17.0</td>
<td>10</td>
<td>4</td>
<td>Q3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>3</td>
<td>2</td>
<td>B1</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>5</td>
<td>5</td>
<td>B1</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>5</td>
<td>5</td>
<td>B2</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>5</td>
<td>5</td>
<td>B2</td>
<td>STM/STA</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>3</td>
<td>2</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>6</td>
<td>5</td>
<td>B3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>10</td>
<td>6.5</td>
<td>Q3</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25.0</td>
<td>16</td>
<td>10</td>
<td>Q15</td>
<td>STM/STA/STE analogue</td>
<td></td>
</tr>
</tbody>
</table>
Possibilities for STE digital:
Torque <-> Running Time <-> Body Size

<table>
<thead>
<tr>
<th>Running Time for 90°</th>
<th>Rated torque [Nm]</th>
<th>Static holding torque (without Power Supply) [Nm]</th>
<th>Body Size</th>
<th>Product Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5s with 200 Hz*</td>
<td>1.2</td>
<td>0.8</td>
<td>Ø3</td>
<td>STE digital</td>
</tr>
<tr>
<td>4.5s with 200 Hz*</td>
<td>3</td>
<td>2.8</td>
<td>Ø3</td>
<td>STE digital</td>
</tr>
<tr>
<td>10s with 200 Hz*</td>
<td>8</td>
<td>4</td>
<td>Ø3</td>
<td>STE digital</td>
</tr>
<tr>
<td>15s with 200 Hz*</td>
<td>10</td>
<td>8</td>
<td>Ø3</td>
<td>STE digital</td>
</tr>
</tbody>
</table>

* Max. Stepper Frequency
## Possibilities: Maximum Cams <-> Body Size

<table>
<thead>
<tr>
<th>Max. Cams:</th>
<th>B0</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>Q3</th>
<th>Q15</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Potentiometer</td>
<td>---</td>
<td>--</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Without Potentiometer</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Graduated Collar</td>
<td>---</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

- Without graduated collar - one additional cam
Type Code For Actuators STM

**Example:** STM30 B3.37/6 51N RP

**Actuator Type:** STM30 B3.37/6 51N RP

STE = electronic actuator
STA = actuator with cams and relay
STM = actuator with cams

**Operation program / wiring:** STM30 B3.37/6 51N RP

5 = Number of function cams
1 = Counter number
N = Cams (“Nocken”)

**Sense of rotation:** STM30 B3.37/6 51N RP

R = Right, L = Left

**Running time for 90°:** STM30 B3.37/6 51N RP

**Body Size:** STM30 B3.37/6 51N RP

B0, B1, B2, B3, Q3, Q15

**Potentiometer installation:** STM30 B3.37/6 51N RP

P = Prepared for potentiometer installation

POT = Potentiometer integrated

**Motor type inside:** STM30 B3.37/6 51N RP

e.g. RSM 36/8, RSM37/6, RSM42/6
Type Code For Actuators STA

Example: STA13 B0.36/8 2N36 LP

Actuator Type: STA13 B0.36/8 2N36 LP
STE=electronic actuator
STA=actuator with cams and relay
STM=actuator with cams

Running time for 90 °: STA13 B0.36/8 2N36 LP

Body Size: STA13 B0.36/8 2N36 LP
B0, B1, B2, B3, Q3, Q15

Motor type inside: STA13 B0.36/8 2N36 LP
e.g. RSM 36/8, RSM37/6, RSM42/6

Operation program / wiring: STA13 B0.36/8 2N36 LP
2=Number of cams to control the motor inside
N=Cams (“Nocken”)
36=Counter number

Sense of rotation: STA13 B0.36/8 2N36 LP
R=Right, L=Left

Potentiometer installation: STA13 B0.36/8 2N36 LP
P = Prepared for potentiometer installation
POT = Potentiometer integrated
### Type Code For Actuators STE

#### Example: STE30 B3.37/6 I01 L

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuator Type:</td>
<td>STE30 B3.37/6 I01 L</td>
</tr>
<tr>
<td>STE=electronic actuator</td>
<td></td>
</tr>
<tr>
<td>STA=actuator with cams and relay</td>
<td></td>
</tr>
<tr>
<td>STM=actuator with cams</td>
<td></td>
</tr>
</tbody>
</table>

| Running time for 90 °:             | STE30 B3.37/6 I01 L   |
| Digital Version = Gear Identifier |                       |
| Analogue Version = Running time    |                       |

| Body Size:                         | STE30 B3.37/6 I01 L   |
| B0, B1, B2, B3, Q3, Q15            |                       |

| Motor type inside:                 | STE30 B3.37/6 I01 L   |
| e.g. RSM 36/8, RSM37/6, RSM42/6    |                       |

#### Operation program / wiring: STE30 B3.37/6 I01 L
- **I** = 4-20mA Input and Feedback
- **U** = 0-10V Input and Feedback
- 01 = Counter number

#### Sense of rotation: STE30 B3.37/6 I01 L
- **R** = Right, **L** = Left
Declaration: Sense Of Rotation

(as you look at the end of the protruding motor shaft)
The Actuators provided by Schneider Electric Motion …

… and all Body Sizes and Housings
STM6 SF-L
STE/ STM Body Size B0
STM/ STE Body Size B1, B2, B3

<table>
<thead>
<tr>
<th>Baugröße</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>65.5</td>
</tr>
<tr>
<td>B2</td>
<td>97.5</td>
</tr>
<tr>
<td>B3</td>
<td>110.5</td>
</tr>
</tbody>
</table>
STE Body Size Q3
STE/ STM Body Size Q15
Reduce Your Energy Consumption

with Actuators provided by Schneider Electric Motion

Schneider Electric Motion Deutschland GmbH
Breslauer Str. 7
77933 Lahr – Germany

www.schneider-electric-motion.com
info@schneider-electric-motion.com