



T5NM...Series

Damper Actuator

Torque 5 N.M

Nominal Voltage: 24VAC/DC, 100~240VAC

- T5NM-D... : 3-position control or On-off
- T5NM-X... : Proportional with various control and feedback signals (0-10VDC, 2-10VDC, 0-20mA, 4-20mA)
- Torque: 5N.M
- 24VAC/DC , 100~240VAC selectable

Design Features

- BLDC motor : constant torque, small size, high-precision, long life
- Manual override
- Adjustable angle of rotation
- Running speed selectable

Type Instruction

Picture	Type	Nominal Torque	Nominal Voltage	Control Type	Manual	IP Level	Running Speed
	T5NM-D24	5N.M	24VAC (50/60Hz), 24VDC	On/off 3-position	yes	54	150s/ 95° 75s/ 95°
	T5NM-D230	5N.M	100~240VAC (50/60Hz)	On/off 3-position	yes	54	150s/ 95° 75s/ 95°
	T5NM-X24	5N.M	24VAC(50/60Hz), 24VDC	Proportional 0(2)~10VDC, 0(4)~20mA	yes	54	150s/ 95° 75s/ 95°
	T5NM-X230	5N.M	100~240VAC (50/60Hz)	Proportional 0(2)~10VDC, 0(4)~20mA	yes	54	150s/ 95° 75s/ 95°

Selectable function 1: 10K resistance feedback function, eg:T5NM-D24-F1

Selectable function 2:1 SPDT feedback function, eg:T5NM-D24-F2

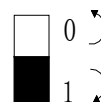
Operating mode

On/Off actuator T5NM-D24/230...

Terminal 1、2 connect with power line , terminal 3 work as the control signal line connect with terminal 2.

When push S2 to "0":
turn off terminal 2、3, position indication will run to "0"
turn on terminal 2、3, position indication will run to "1"

When push S2 to "1":
turn off terminal 2、3, position indication will run to "1"
turn on terminal 2、3, position indication will run to "0"



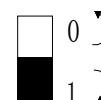
3-position actuator T5NM-D24/230...

When push S2 to "0":

When terminal 1、2 with voltage	position indication will run to "0"
When terminal 1、3 with voltage	position indication will run to "1"
When terminal 1、2 and 1、3 without voltage	position indication keeping in the current position

When push S2 to "1":

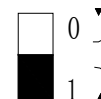
When terminal 1、2 with voltage	position indication will run to "1"
When terminal 1、3 with voltage	position indication will run to "0"
When terminal 1、2 and 1、3 without voltage	position indication keeping in the current position



Proportional actuator T5NM-X24/230...

T5NM-X24...input control signal through terminal 1, 3
output feedback signal through terminal 1, 5
(control signal/ feedback signal, 0(2)~10VDC , 0(4)~20mA)

When push S2 to "0"
control signal value increasing, position indication will run to "1"
control signal valve decreasing, position indication will run to "0"
When push S2 to "1", the position indication will run to the opposite direction



T5NM-X230...input control signal through terminal 3, 4
output feedback signal through terminal 3, 5
(control signal/ feedback signal, 0(2)~10VDC, 0(4)~20mA)

When push S2 to "0"
control signal value increasing, position indication will run to "1"
control signal valve decreasing, position indication will run to "0"
When push S2 to "1", the position indication will run to the opposite direction

Switch S1:setting

S1 switch	Function	Description
1	Starting point of control / feedback signal	ON 20%:starting point of control /feedback signal is 20% (namely 4~20mA or 2~10VDC)
		OFF 0: starting point of control /feedback signal is 0 (namely 0~20mA or 0~10VDC)
2	Control signal setting	ON II: input current control signal
		OFF UI: input voltage control signal
3	Feedback signal setting	ON IO: output current feedback signal
		OFF UO: output voltage feedback signal

Eg



Control signal: 0~10VDC
Feedback signal: 0~10VDC



Control signal: 4~20mA
Feedback signal: 4~20mA

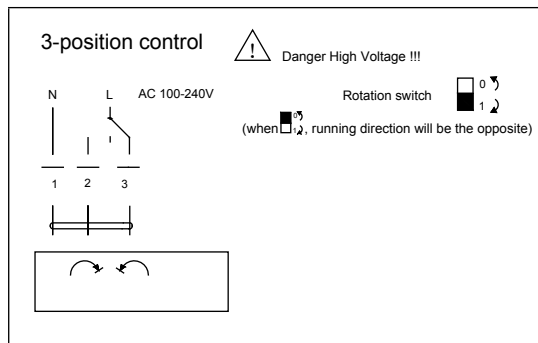
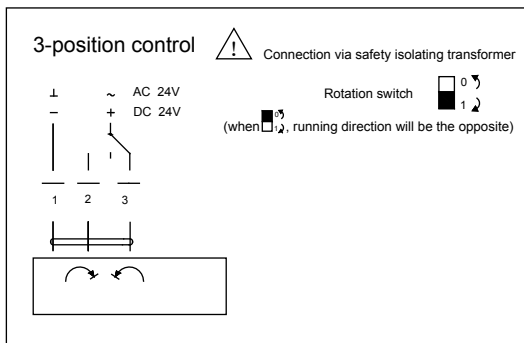
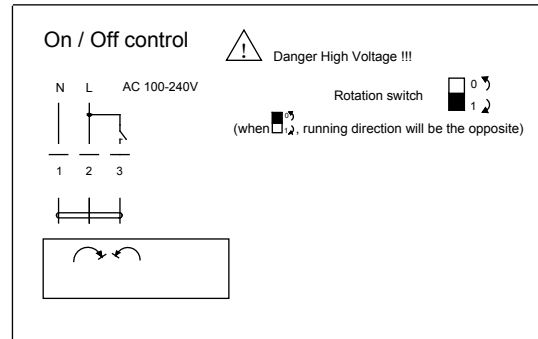
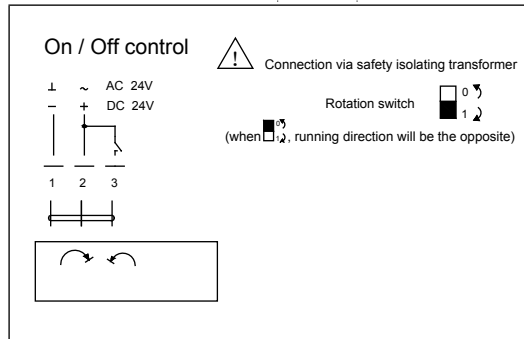
Technical data

Electrical data	Motor	Brushless direct current motor
	Nominal voltage	24VAC 50/60Hz, 24VDC 100..240VAC 50/60Hz
	Norminal voltage range	19.2...28.8VAC/DC 85...265VAC
	Power consumption	T5N.M-D...running: 5W; holding: 2.5W T5N.M-X...running: 6W; holding: 2.5W
	Control types	On/off and 3-position type proportional type 0(2)~10VDC, 0(4)~20mA
	Proportional actuator control signal	0(2)~10VDC, 0(4)~20mA
	Proportional actuator feedback signal	> 100K 0.50K
	Impedance(Proportional actuator) Voltage input impedance Current input impedance	> 1K
	Load requirements (Proportional actuator) Voltage output load requirement Current output load requirement	<0.5K
Functon data	Torque	5N.M
	Shaft diameter 	6~17mm
	Rotation direction	Select from rotation switch
	Rotation angle	Max.95°, rotation angle adjustable
	Running time	150s/95° 75s/95°(select from S3: speed switch)
	Manual override	Gearing latch can be disengaged by the pushbutton
	Protection degree	IP54
Ambient data	Ambient temperature range	-30~+50℃
	Non-operating temperature	-40~+80℃
	Ambient humidity range	≤95% RH
Dimension and weight	Covering material	PC+GF
	Board material	Hot-galvanized sheets
	Net. weight	Approx. 350 G
	Dimension	See on page 7

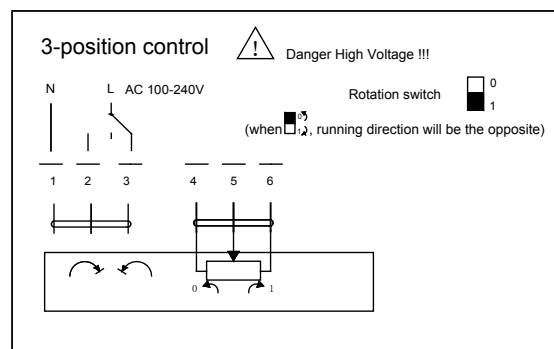
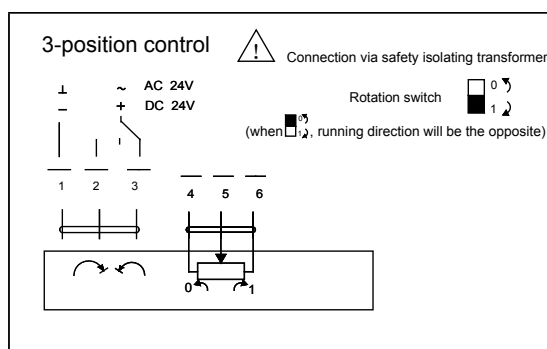
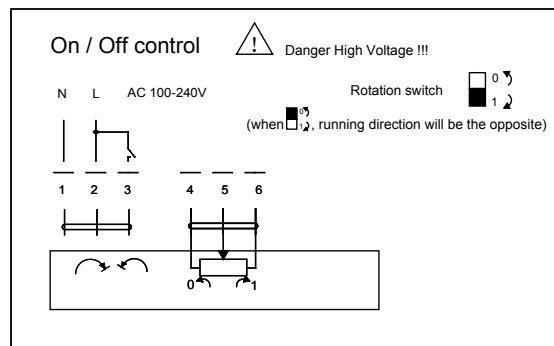
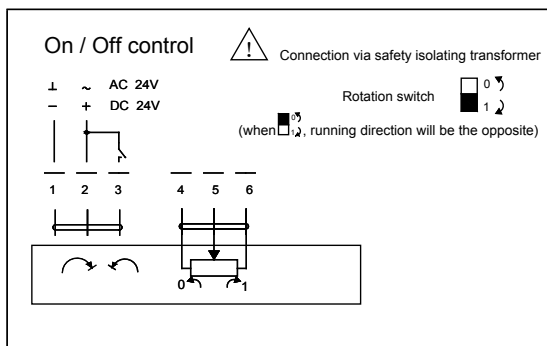
Wiring diagrams:

On/off actuator / 3-position actuator: can be connected in parallel. Please note the power consumption.

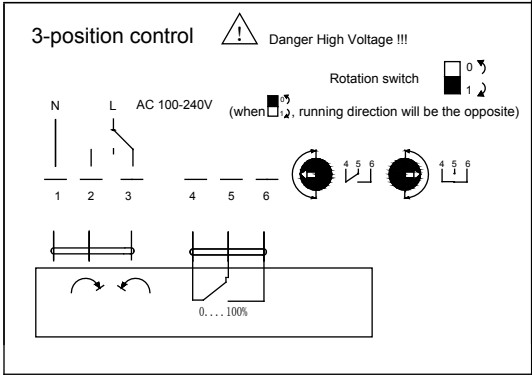
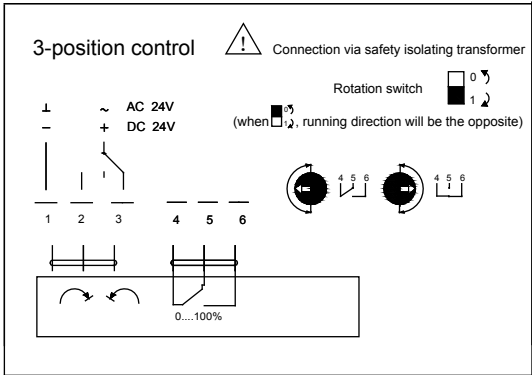
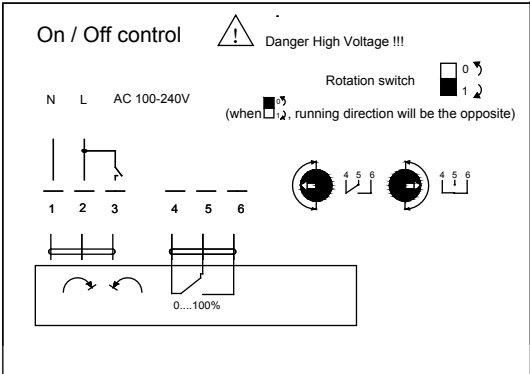
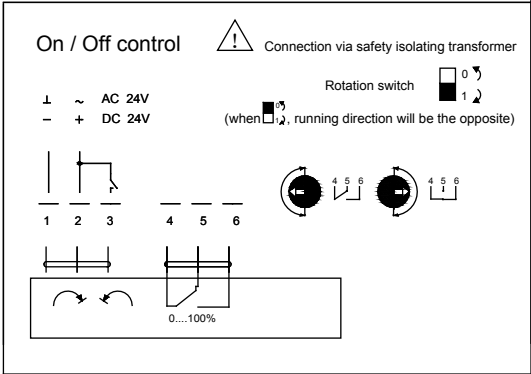
Type: T5/10/20NM-D24/230



Type: T5/10/20NM-D24/230-F1

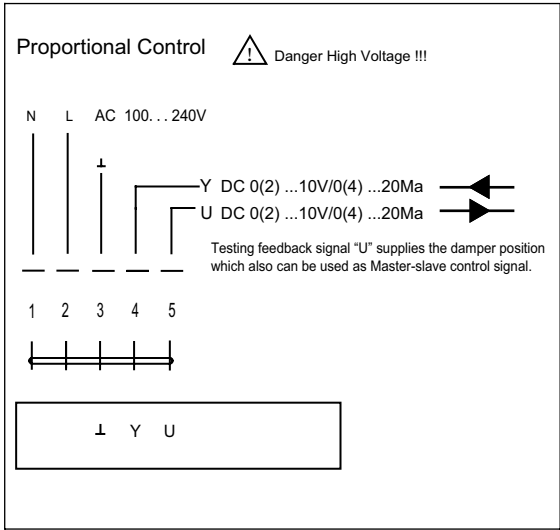
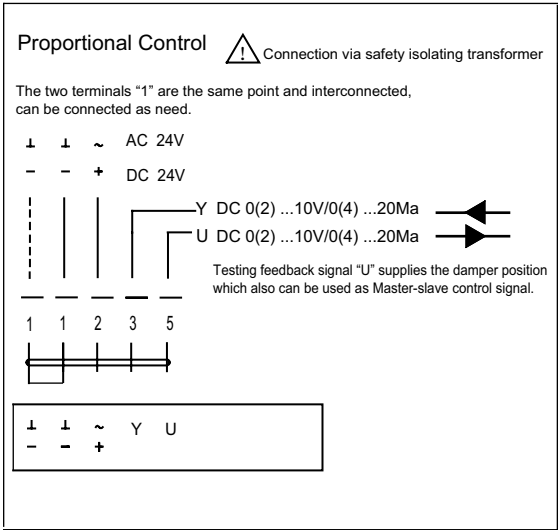


Type: T5/10/20NM-D24/230-F2



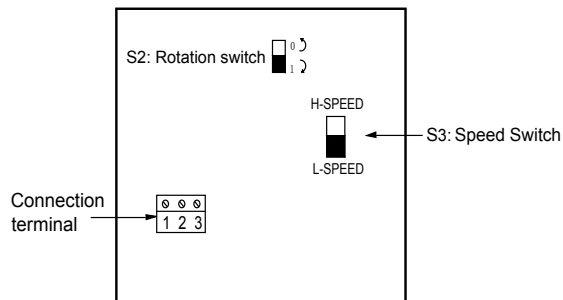
Proportional actuator: can be connected in parallel. Please note the power consumption.

Type: T5/10/20NM-X24/230



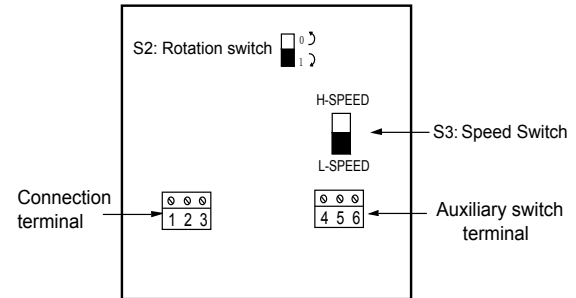
Circuit board illustration:

1.



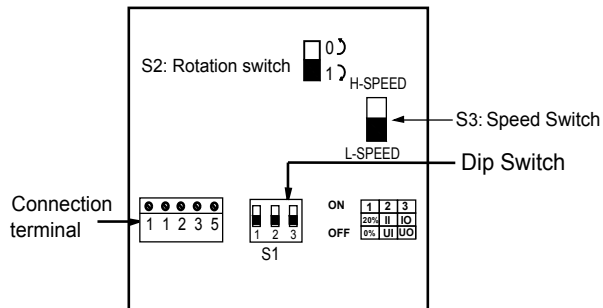
24VAC/DC, 230VAC On/off and 3-position

2.



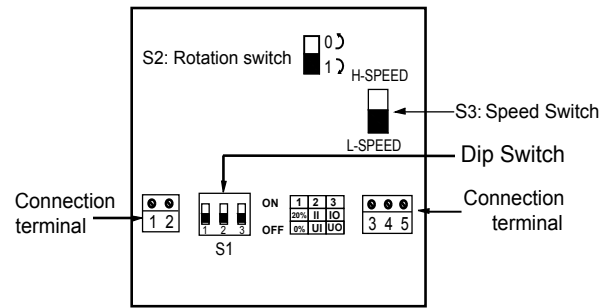
24VAC/DC, 230VAC On/off and 3-position
with F1/F2 feedback function

3.



24VAC/DC proportional

4.



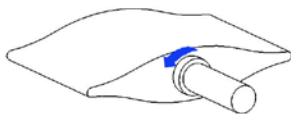
230VAC proportional

Wiring line

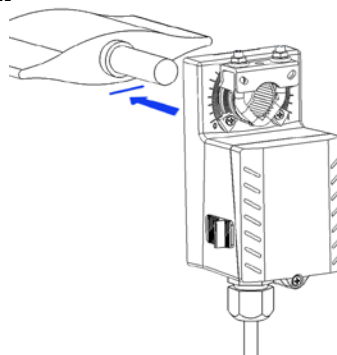
Type	Dimension	Length(m)	Line NO. and Colour
L1-2	2*0.75mm ²	0.5	1 (red); 2(yellow)
L1-2-3	3*0.75mm ²	0.5	1(red); 2(yellow); 3(green)
L3-4-5	3*0.75mm ²	0.5	3(green); 4(blue); 5(white)
L4-5-6	3*0.75mm ²	0.5	4(blue); 5(white); 6(brown)
L1-2-3-5	4*0.75mm ²	0.5	1(red); 2(yellow); 3(green); 5(white)

Installation

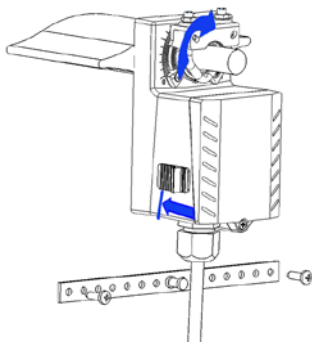
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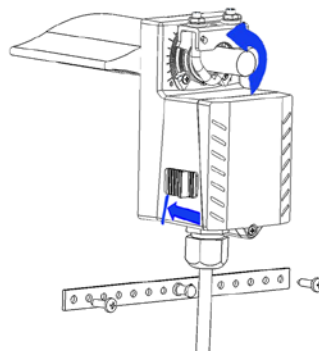
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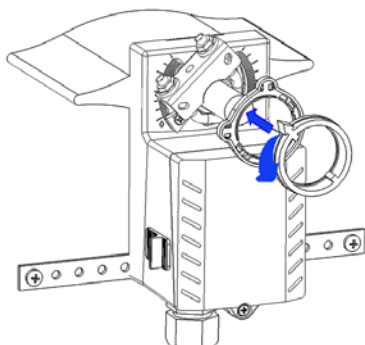
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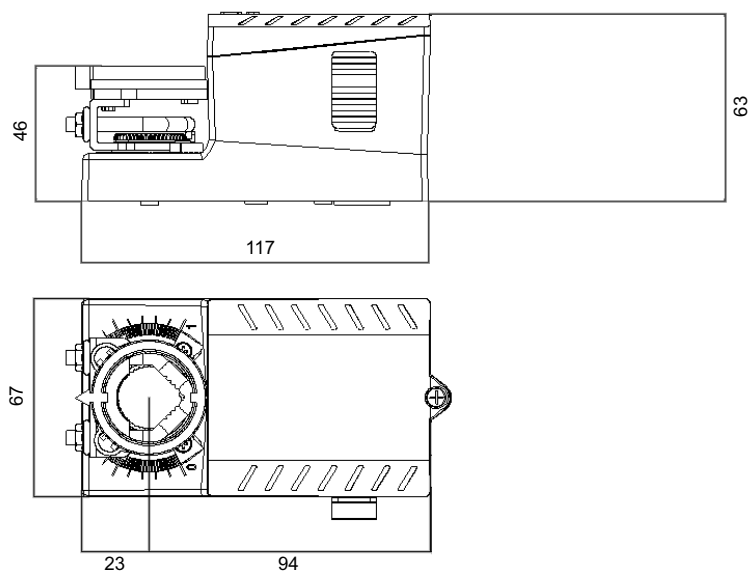
4.



5.



Dimension





T10NM...Series T20NM...Series

Damper Actuator

Torque 10/20 N.M

Nominal Voltage: 24VAC/DC, 100~240VAC

- T10NM-D/T20NM-D... : 3-position control or On-off
- T10NM-X/T20NM-X... : Proportional with various control and feedback signals (0-10VDC, 2-10VDC, 0-20mA, 4-20mA)
- Torque: 10/20N.M
- 24VAC/DC, 100~240VAC selectable

Design Features

- BLDC motor : constant torque, small size, high-precision, long life
- Manual override
- Adjustable angle of rotation
- Running speed selectable

Type Instruction

Picture	Type	Normal Torque	Normal Voltage	Control Type	Manual	IP Level	Running Speed
	T10NM-D24	10N.M	24VAC (50/60Hz), 24VDC	On/off 3-position	yes	54	150s/ 95° 100s/ 95°
	T10NM-D230	10N.M	100~240VAC (50/60Hz)	On/off 3-position	yes	54	150s/ 95° 100s/ 95°
	T10NM-X24	10N.M	24VAC (50/60Hz), 24VDC	Proportional 0(2)~10VDC , 0(4)~20mA	yes	54	150s/ 95° 100s/ 95°
	T10NM-X230	10N.M	100~240VAC (50/60Hz)	Proportional 0(2)~10VDC , 0(4)~20mA	yes	54	150s/ 95° 100s/ 95°
	T20NM-D24	20N.M	24VAC (50/60Hz), 24VDC	On/off 3-position	yes	54	150s/ 95° 100s/ 95°
	T20NM-D230	20N.M	100~240VAC (50/60Hz)	On/off 3-position	yes	54	150s/ 95° 100s/ 95°
	T20NM-X24	20N.M	24VAC (50/60Hz), 24VDC	Proportional 0(2)~10VDC , 0(4)~20mA	yes	54	150s/ 95° 100s/ 95°
	T20NM-X230	20N.M	100~240VAC (50/60Hz)	Proportional 0(2)~10VDC , 0(4)~20mA	yes	54	150s/ 95° 100s/ 95°

Selectable function 1: 10K resistance feedback function, eg:T10NM-D24-F1

Selectable function 2: 1SPDT feedback function, eg:T10NM-D24-F2

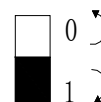
Operating mode

On/Off actuator T10/20NM-D24/230...

Terminal 1、2 connect with power line , terminal 3 work as the control signal line connect with terminal 2.

When push S2 to "0":
turn off terminal 2、3, position indication will run to "0"
turn on terminal 2、3, position indication will run to "1"

When push S2 to "1":
turn off terminal 2、3, position indication will run to "1"
turn on terminal 2、3, position indication will run to "0"



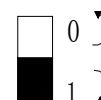
3-position actuator T10/20NM-D24/230...

When push S2 to "0":

When terminal 1、2 with voltage position indication will run to "0"
When terminal 1、3 with voltage position indication will run to "1"
When terminal 1、2 and 1、3 without voltage position indication keeping in the current position

When push S2 to "1":

When terminal 1、2 with voltage position indication will run to "1"
When terminal 1、3 with voltage position indication will run to "0"
When terminal 1、2 and 1、3 without voltage position indication keeping in the current position



Proportional actuator T10/20NM-D24/230...

T10NM-X24...input control signal through terminal 1, 3
output feedback signal through terminal 1, 5
(control signal / feedback signal, DC 0(2)~10V, DC 0(4)~20mA)

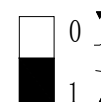
When push S2 to "0"
control signal value increasing, position indication will run to "1"
control signal value decreasing, position indication will run to "0"

When push S2 to "1", the position indication will run to the opposite direction

T10NM-X230...input control signal through terminal 3, 4
output feedback signal through terminal 3, 5
(control signal / feedback signal, DC 0(2)~10V, DC 0(4)~20mA)

When push S2 to "0"
control signal value increasing, position indication will run to "1"
control signal value decreasing, position indication will run to "0"

When push S2 to "1", the position indication will run to the opposite direction



Switch S1:setting

S1 switch	Function	Description
1	Starting point of control / feedback signal	ON 20%:starting point of control /feedback signal is 20% (namely 4~20mA or 2~10VDC)
		OFF 0: starting point of control /feedback signal is 0 (namely 0~20mA or 0~10VDC)
2	Control signal setting	ON II: input current control signal
		OFF UI: input voltage control signal
3	Feedback signal setting	ON IO: output current feedback signal
		OFF UO: output voltage feedback signal

Eg



Control signal: 0~10VDC
Feedback signal: 0~10VDC



Control signal: 4~20mA
Feedback signal: 4~20mA

Technical data

Electrical data	Motor	Brushless direct current motor
	Nominal voltage	24VAC 50/60Hz, 24VDC 100..240VAC 50/60Hz
	Norminal voltage range	19.2...28.8VAC/DC 85...265VAC
	Power consumption	T10/20NM-D...running: 5W; holding: 2.5W T10/20NM-X...running: 6W; holding: 2.5W
	Control types	On/off and 3-position type proportional type
	Proportional actuator control signal	0(2)~10VDV, 0(4)~20mA
	Proportional actuator feedback signal	0(2)~10VDC, 0(4)~20mA
	Impedance(Proportional actuator)	> 100K
	Voltage input impedance	0.50K
	Current input impedance	
	Load requirements (Proportional actuator)	> 1K
	Voltage output load requirement	<0.5K
	Current output load requirement	

Function data	Torque	10N.M
	Shaft diameter 	10~20mm
	Rotation direction	Select from rotation switch
	Rotation angle	Max.95°, rotation angle adjustable
	Running time	150s/95° 100s/95°(select from S3:speed switch)
	Manual override	Gearing latch can be disengaged by the pushbutton
	Protection degree	IP54

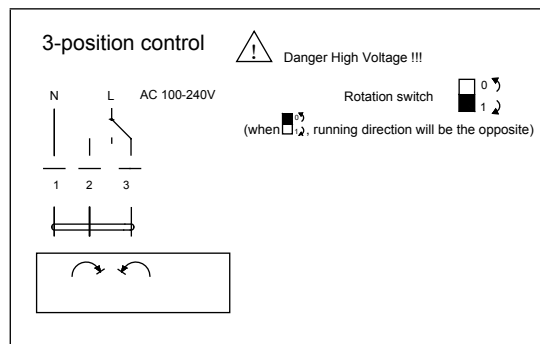
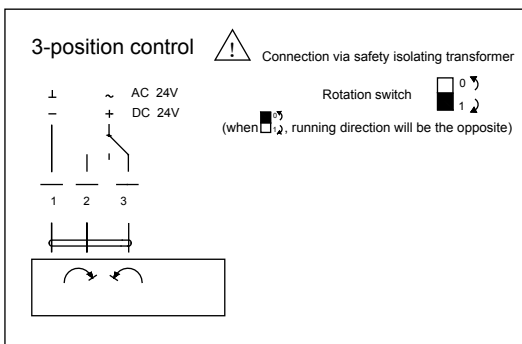
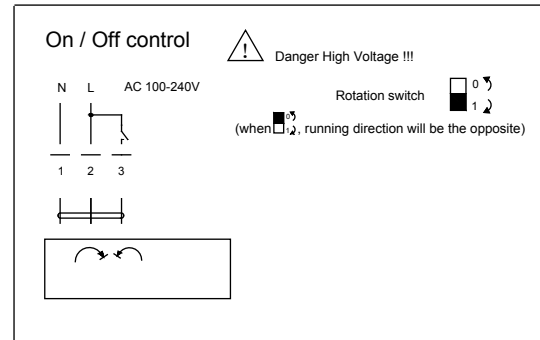
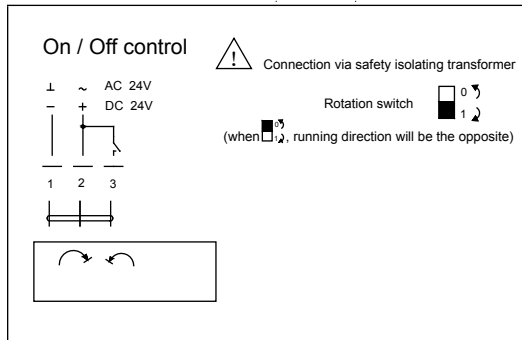
Ambient data	Ambient temperature range	-30~+50℃
	Non-operating temperature	-40~+80℃
	Ambient humidity range	≤95% RH
	Covering material	PC+GF
	Board material	Hot-galvanized sheets

Dimension and weight	Net weight	Approx. 800 G
	Dimension	See on page 7

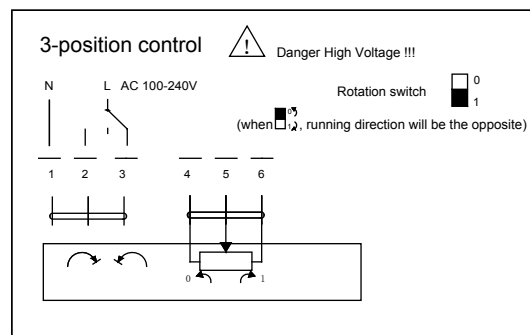
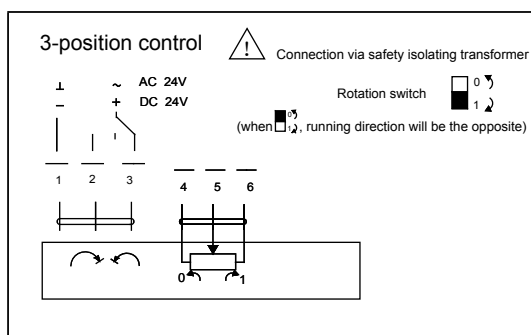
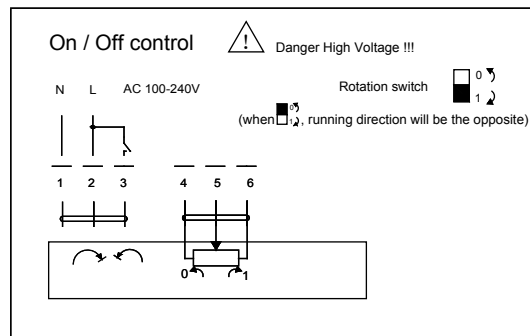
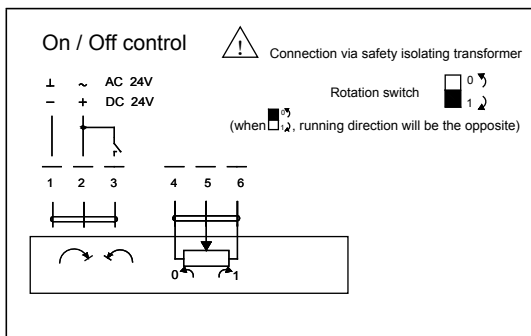
Wiring diagrams:

On/off actuator / 3-position actuator: can be connected in parallel. Please note the power consumption.

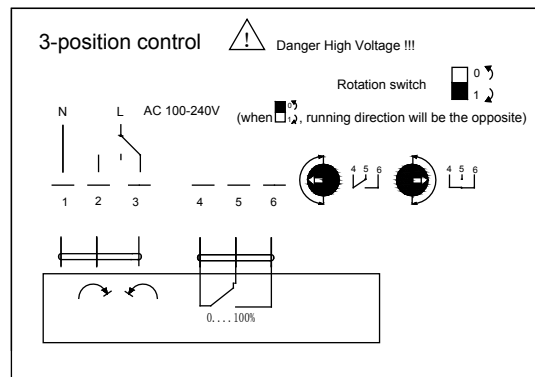
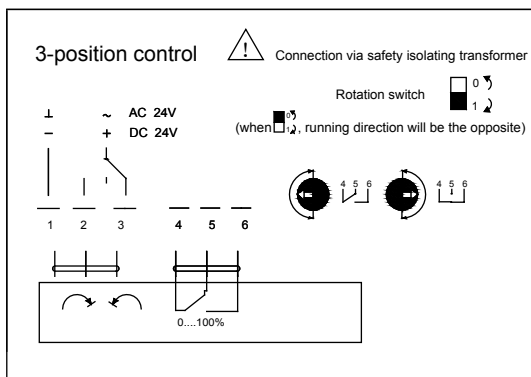
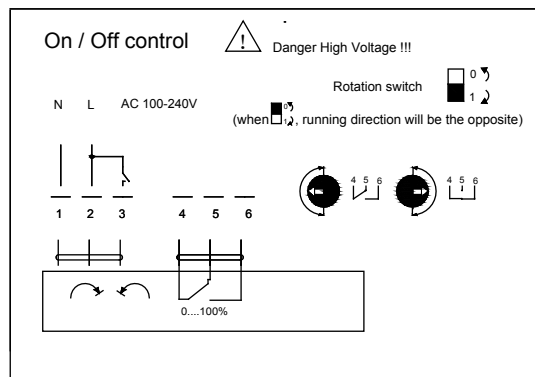
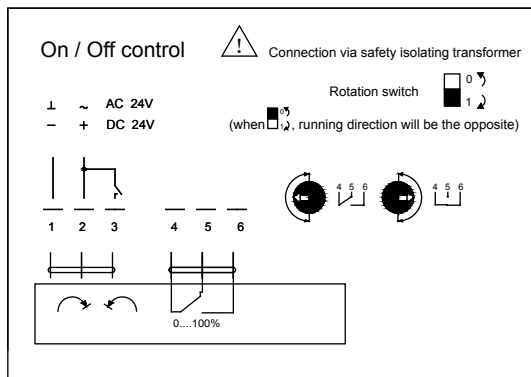
Type: T5/10/20NM-D24/230



Type: T5/10/20NM-D24/230-F1

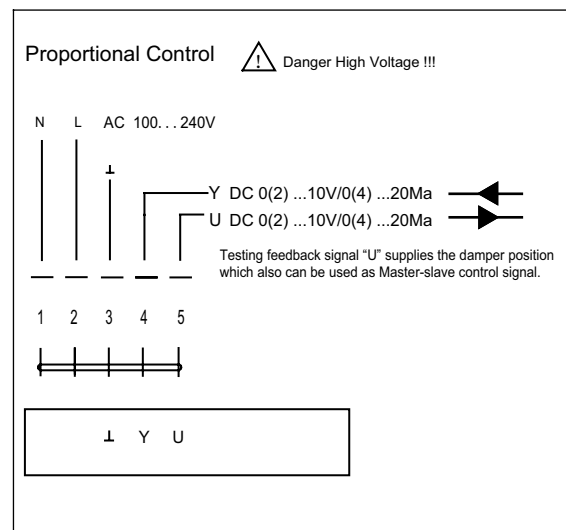
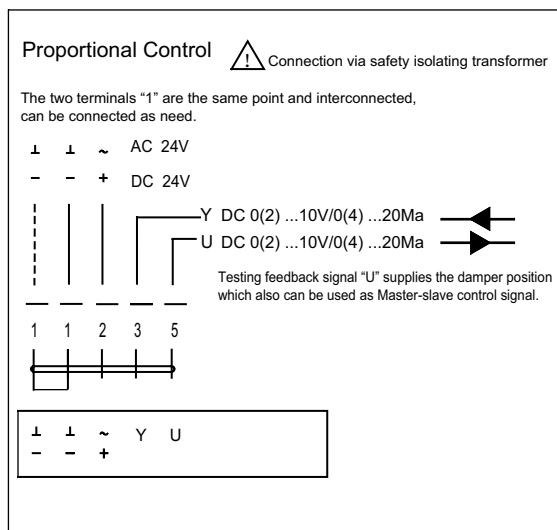


Type: T5/10/20NM-D24/230-F2



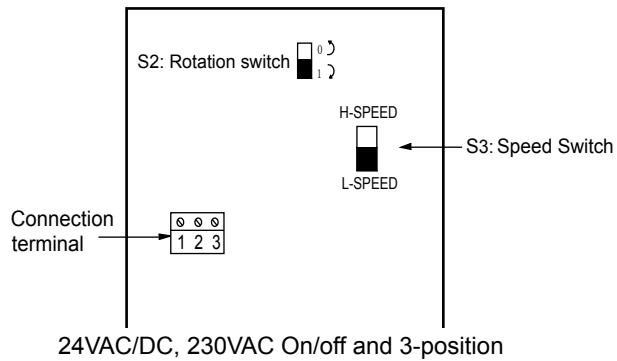
Proportional actuator: can be connected in parallel. Please note the power consumption.

Type: T5/10/20NM-X24/230

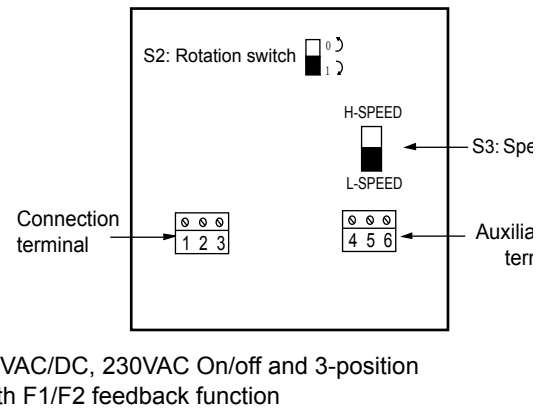


Circuit board illustration:

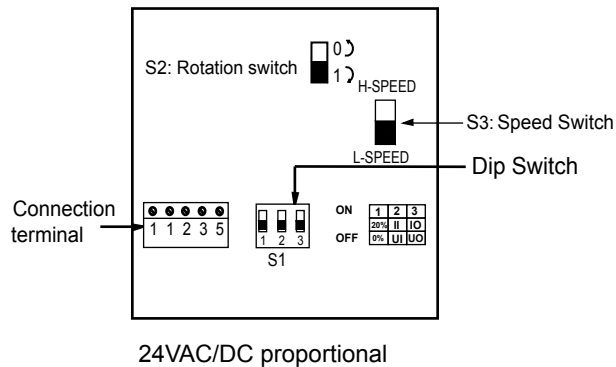
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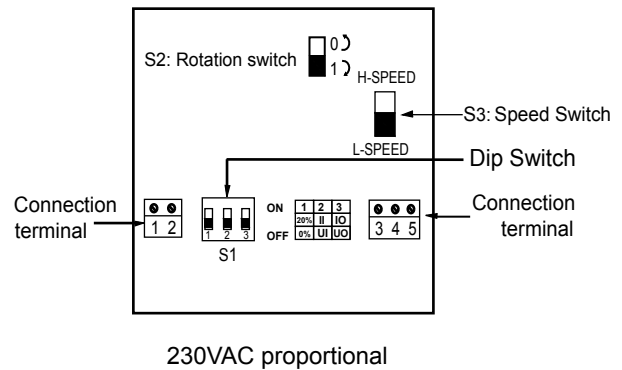
2.



3.



4.

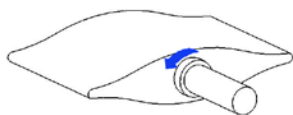


Wiring line

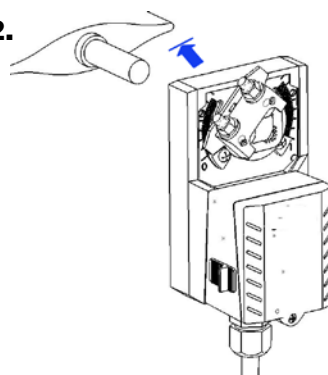
Type	Dimension	Line NO. and Colour
L1-2	2*0.75mm ²	1 (red); 2(yellow)
L1-2-3	3*0.75mm ²	1(red); 2(yellow); 3(green)
L3-4-5	3*0.75mm ²	3(green); 4(blue); 5(white)
L4-5-6	3*0.75mm ²	4(blue); 5(white); 6(brown)
L1-2-3-5	4*0.75mm ²	1(red); 2(yellow); 3(green); 5(white)

Installation

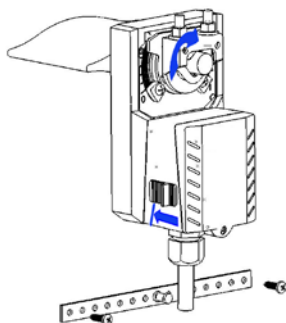
1.



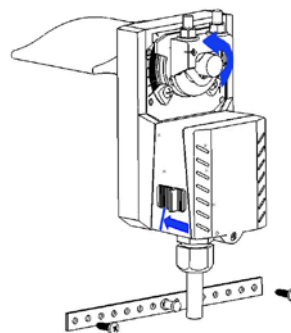
2.



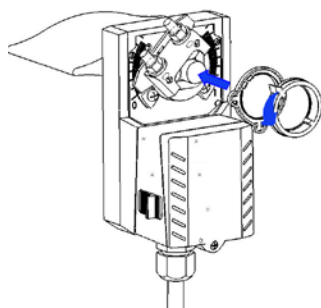
3.



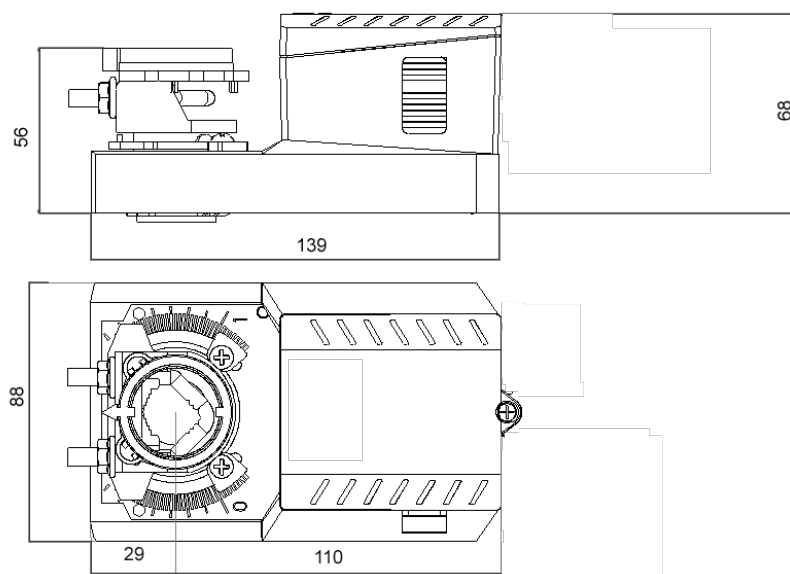
4.



5.



Dimension



Selection of the damper

Torque load per unit area of typical damper in HVAC system

Damper type	Torque load Nm/m ² (based on the airflow speed and the static pressure of the pipe)		
	<5m/s/ 300Pa	5 -12m/s or 450Pa	>12m/s or 500Pa
◆ Airtight application			
round vane/rimseal	12	18	24
parallel vane/rimseal	8.5	13	17
folio vane/rimseal	6	9	12
◆ Common application			
round vane/rimless-seal	6	9	12
parallel vane/rimless-seal	5	7.5	10
folio vane/rimless-seal	3.5	5	7

Note:

1. Pls choose the actuator type according to the above torque load of the damper to calculate the torque.
2. Pls confirm the torque with the damper manufacturer.

◆ Damper Actuator Selection Formula

$$\begin{array}{rclclcl}
 \text{Example:} & \text{Damper area} & \times & \text{Rated load per unit area} & = & \text{Required Torque} \\
 & 1.6 \text{ m}^2 & \times & 6 \text{ N.M/m}^2 & = & 9.6 \text{ N.M}
 \end{array}$$