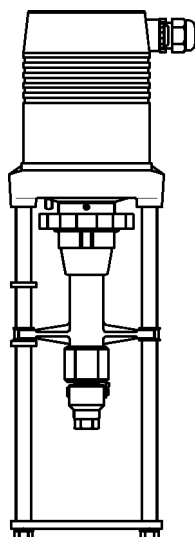


30mm - 1600N



160U44
163U44

HIGHLIGHTS

- Microprocessor controlled with automatic self-calibration on start up
- Wear-free distance measuring system - no potentiometer
- LED indication of actuator status
- Permanent storage of stroke in EPROM memory, values can not be lost
- Wire break recognition in 2...10 VDC and 4...20 mA operation
- Bonnet detachable in four positions, 90° locking, no screws required
- Safety position for switching a binary signal (frost safety)
- Pull-out manual adjustment with message signal
- Fault recognition in continuous operation (in case of blockage by foreign bodies)
- Input and output signal independently reversible
- Hysteresis and characteristics freely adjustable
- Shockproof at 230 VAC, no protective conductor (PE) necessary

DESCRIPTION

The microprocessor controlled actuators, series 160.. and 163.., are designed for use on control valves in HVAC plants.

The rotary motion of the stepping motor is converted into a linear movement via a planetary gearing and a threaded stem with stem nut.

Modulating operation as well as on/off or 3-point control is possible. In both modes a load-dependent blocking detection switches off as soon as one of the two end positions is reached, or blocking occurs due to overload.

The series 160.. and 163.. offer a 1600 N push and pull force for a 30mm stroke at maximum.

3-point control

By connecting a 3-point control signal to the 3P input, the direction of motion of the linear actuator and thus of the valve can be determined directly.

Modulating control signal (Y)

The electronic positioner of the actuator compares the setpoint input signal (Y) with the actual value of the valve (stroke) specified by the controller of the system. In case of a deviation, the actuator is triggered until conformity between set value and actual value is achieved.

The sense of action of the input signal (direct control or indirect control) can be reversed if necessary.

Broken wire detection

When the input signal Y is interrupted during 0..10Vdc or 0..20mA operation, the linear actuator moves into the 0 Volt position.

When the input signal Y is interrupted during 2..10Vdc or 4..20mA operation, the linear actuator moves into the end position which can be preselected.

An LED signals the warning : "broken wire detected".

Feedback signal

The actual position of the valve is available as an analog output signal (X) 0..10Vdc (0..100%).



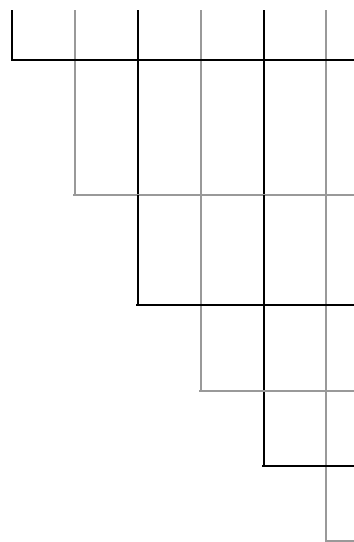
30mm - 1600N

PRODUCT KEY

The product identification key contains all essential data defining the unique features of the valve actuator.

Example : type 160U44 - x

160 U 4 4 - x



actuator trust force N (x10)

160 : 1600 N

163 : 1600 N (modified mounting principle : see drawing hereafter)

M : 3-point control

U : 0-10 Vdc (or 0-10Vdc and 3-point)

i : 4-20 mA

2 : 230 Vac

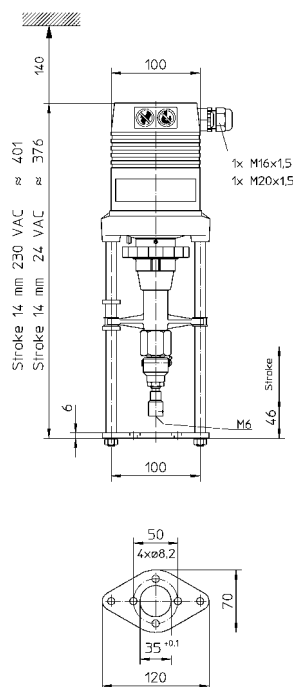
4 : 24 Vac

running time [s/mm] for 0...100% of the travel

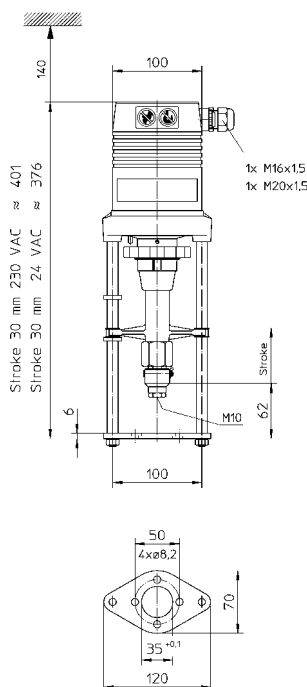
extension for special executions

DRAWING

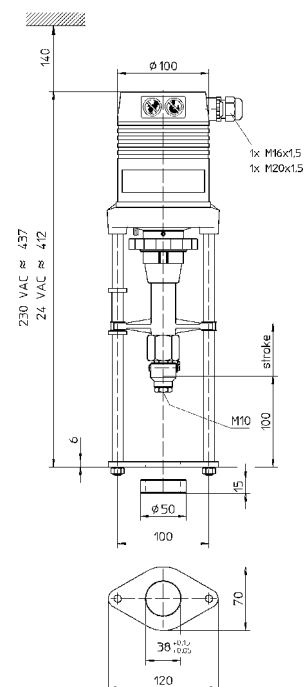
160.. AND 163.. TYPE ACTUATORS



160.. TYPE ACTUATORS
for valves DN32-DN50



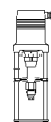
160.. TYPE ACTUATORS
for valves DN65-DN100



163.. TYPE ACTUATORS



30mm - 1600N

TECHNICAL DATA VALVE ACTUATOR SERIES 160..


ACTUATOR TYPE		160U44	160U24	160i44	160i24
Actuating time at 50 Hz ¹⁾	s/mm	6 · 4*	6 · 4*	6 · 4*	6 · 4*
Actuating thrust	N	1600	1600	1600	1600
Stroke	mm	max. 30	max. 30	max. 30	max. 30
Power supply	VAC	24 ±10%	230 +6% -10%	24 ±10%	230 +6% -10%
Power supply ⁴⁾	VDC	24 ±10%	-	24 ±10%	-
Frequency	Hz	50/60 ±5%	50/60 ±5%	50/60 ±5%	50/60 ±5%
Power consumption	VA	6	12	6	12
Input signal ²⁾		• 3-point, or • 0(2)...10 VDC (77 kOhm)		0(4)...20 mA (0.5 kOhm)	
Output signal ²⁾		0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm
Hysteresis ³⁾	V	0.15* · 0.5	0.15* · 0.5	0.15* · 0.5	0.15* · 0.5

Enclosure protection:	IP 54
Resolution:	electric mechanical
Operating mode:	S3-50% ED c/h 1200
End position switch-off:	load-dependent
Ambient temperature:	0...+50°C
Weight:	3.2 kg

Actuator alternatives and accessories

- Voltage: 115 VAC
- Position switch unit ⁵⁾: 2 switches, potential free, infinitely adjustable
 Rated load: 8 A / 250 VAC
 8 A / 30 VDC
 Turn-on voltage: max. 400 VAC
 max. 125 VDC
- Enclosure protection: IP 65
- Output signal ⁵⁾: X=0(4)...20 mA
- Distance pillars, traverse and all screws located on exterior made of stainless steel

¹⁾ Actuating time freely adjustable, presetting is marked with *

²⁾ Invertible input and output signal

³⁾ Freely adjustable

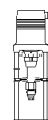
⁴⁾ Please state when ordering, which kind of direct-current

1. smooth direct current or
2. rectified alternating voltage

⁵⁾ Position switch unit and output signal not in combination



30mm - 1600N

TECHNICAL DATA VALVE ACTUATOR SERIES 163..


ACTUATOR TYPE		163U44	163U24	163i44	163i24
Actuating time at 50 Hz ¹⁾	s/mm	6 · 4*	6 · 4*	6 · 4*	6 · 4*
Actuating thrust	N	1600	1600	1600	1600
Stroke	mm	max. 30	max. 30	max. 30	max. 30
Power supply	VAC	24 ±10%	230 +6% -10%	24 ±10%	230 +6% -10%
Power supply ⁴⁾	VDC	24 ±10%	-	24 ±10%	-
Frequency	Hz	50/60 ±5%	50/60 ±5%	50/60 ±5%	50/60 ±5%
Power consumption	VA	6	12	6	12
Input signal ²⁾		• 3-point, or • 0(2)...10 VDC (77 kOhm)		0(4)...20 mA (0.5 kOhm)	
Output signal ²⁾		0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm	0...10 VDC max. 8 mA min.1200 Ohm
Hysteresis ³⁾	V	0.15* · 0.5	0.15* · 0.5	0.15* · 0.5	0.15* · 0.5

Enclosure protection:	IP 54
Resolution:	electric mechanical
Operating mode:	S3-50% ED c/h 1200
End position switch-off:	load-dependent
Ambient temperature:	0...+50°C
Weight:	3.2 kg

Actuator alternatives and accessories

- Voltage: 115 VAC
- Position switch unit ⁵⁾: 2 switches, potential free, infinitely adjustable
 Rated load: 8 A / 250 VAC
 8 A / 30 VDC
 Turn-on voltage: max. 400 VAC
 max. 125 VDC
- Enclosure protection: IP 65
- Output signal ⁵⁾: X=0(4)...20 mA
- Distance pillars, traverse and all screws located on exterior made of stainless steel

¹⁾ Actuating time freely adjustable, presetting is marked with *

²⁾ Invertible input and output signal

³⁾ Freely adjustable

⁴⁾ Please state when ordering, which kind of direct-current

1. smooth direct current or

2. rectified alternating voltage

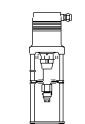
⁵⁾ Position switch unit and output signal not in combination



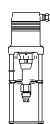
30mm - 1600N

ELECTRICAL WIRING

AC 24 VOLT MODULATING CONTROL SIGNAL 0-10VDC

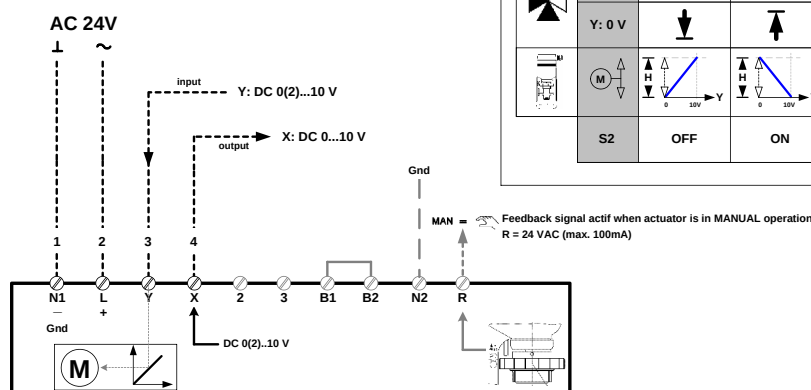


160U44



163U44

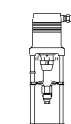
Modulating control signal 0-10Vdc



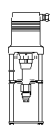
B1/B2 connection of a binary signal (DI)

Control signal (input)		Default	
	Y: 10 V		
	Y: 0 V		
	S2	OFF	ON

AC 24 VOLT MODULATING CONTROL SIGNAL 4-20mA

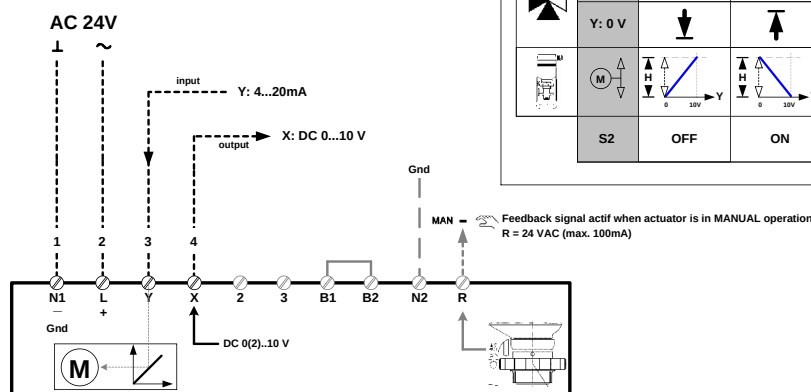


160i44



160i44

Modulating control signal 4-20mA



B1/B2 connection of a binary signal (DI)

Control signal (input)		Default	
	Y: 10 V		
	Y: 0 V		
	S2	OFF	ON

N2 is the zero potential for the „X“, „Y“ and „R“ signals.

- 24 VAC(DC) : it is recommended to connect N2 in case of actuators in 24 VAC(DC) design.

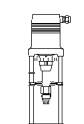
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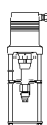
30mm - 1600N

ELECTRICAL WIRING

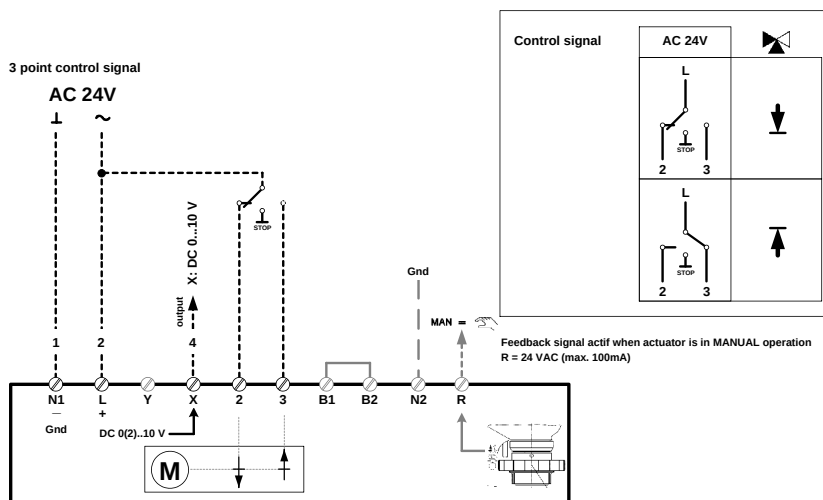
AC 24 VOLT 3-POINT CONTROL SIGNAL



160U44

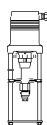


163U44



B1/B2 connection of a binary signal (DI)

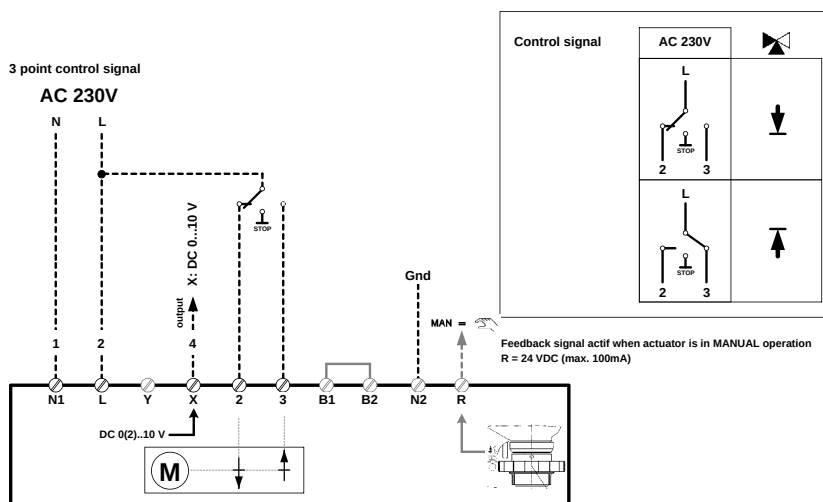
AC 230 VOLT 3-POINT CONTROL SIGNAL



160U24



163U24



B1/B2 connection of a binary signal (DI)

N2 is the zero potential for the „X“, „Y“ and „R“ signals.

- 24 VAC(DC) : it is recommended to connect N2 in case of actuators in 24 VAC(DC) design.
- 230 VAC : if the actuators in 230 VAC design are to be triggered on the „continuous“ mode of operation, i.e. by analogue signal „Y“, the connection of N2 (zero potential of the controller) is absolutely necessary. For actuators in 230 VAC design the connection N2 in the „3-position“ mode of operation is only necessary if „X“ and/or „R“ are to be used by the actuator. If the zero potentials of the signals X, Y and R are identical with the zero potential of the supply voltage, a bridge can be laid between N1 and N2 in order to save an additional lead to N2.

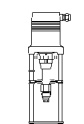
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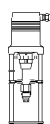
30mm - 1600N

ELECTRICAL WIRING

AC 230 VOLT MODULATING CONTROL SIGNAL 0-10Vdc

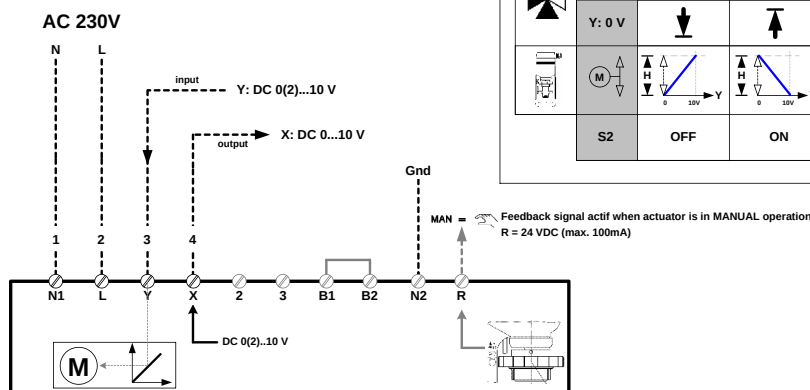


160U24



163U24

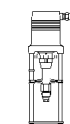
Modulating control signal 0-10Vdc



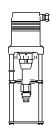
B1/B2 connection of a binary signal (DI)

Control signal (input)		Default	
	Y: 10 V		
	Y: 0 V		
	S2	OFF	ON

AC 230 VOLT MODULATING CONTROL SIGNAL 4-20mA

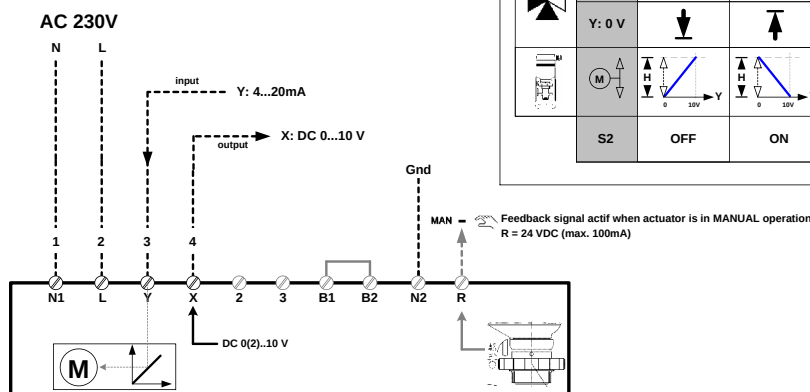


160i24



163i24

Modulating control signal 4-20mA



B1/B2 connection of a binary signal (DI)

Control signal (input)		Default	
	Y: 10 V		
	Y: 0 V		
	S2	OFF	ON

N2 is the zero potential for the „X“, „Y“ and „R“ signals.

- 230 VAC : if the actuators in 230 VAC design are to be triggered on the „continuous“ mode of operation, i.e. by analogue signal „Y“, the connection of N2 (zero potential of the controller) is absolutely necessary. For actuators in 230 VAC design the connection N2 in the „3-position“ mode of operation is only necessary if „X“ and/or „R“ are to be used by the actuator. If the zero potentials of the signals X, Y and R are identical with the zero potential of the supply voltage, a bridge can be laid between N1 and N2 in order to save an additional lead to N2.

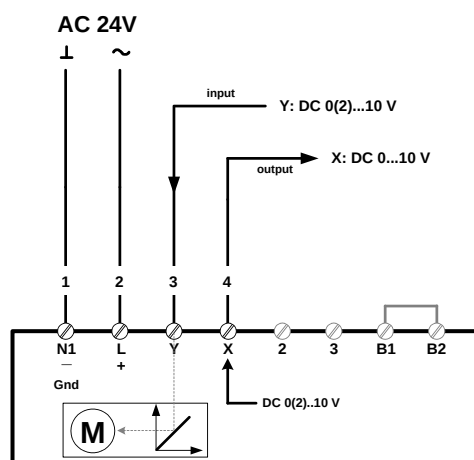
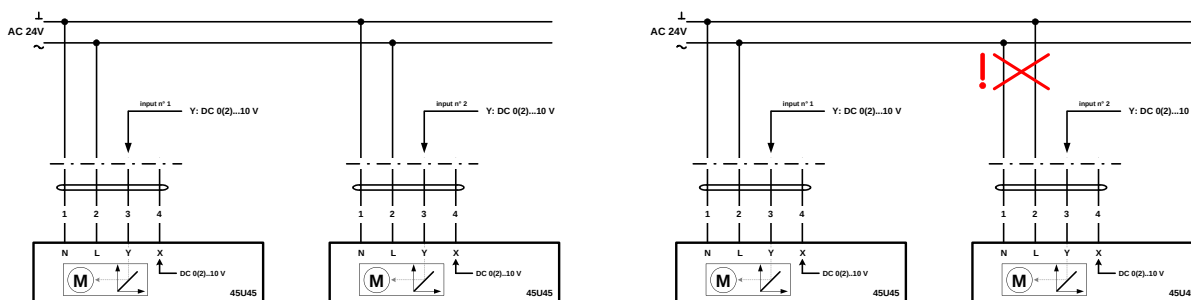
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30mm - 1600N

APPLICATION EXAMPLE

COMMON MASS CONNECTIONS SHOULD ALWAYS BE RESPECTED !



B1/B2 Connection of a binary signal (e.g. frost safety)

When the current flow between the terminals B1 and B2 is interrupted, the actuator moves into the end position preselected by S6 dip-switch. Circuit interruption between B1-B2 has priority above all other input signals.

In 3-point control mode the last position of the stem before switching event is stored and is started up again automatically after the circuit interruption is restored.

INITIALIZING - COMMISSIONING



During initial commissioning and after repairs, initialization of the incremental travel measuring system is required.

The INIT (initialization) key on the PCB board or simultaneous signal on terminals 2 and 3 serves to trigger initialization.

By pressing the INIT key >3s (until the actuator starts running), the exact travel length of the valve is measured and stored in the microcontroller for accurate operation.

When applying simultaneous signal on terminals 2 and 3, the signal must be applied for >3s at least.

INSTALLATION

